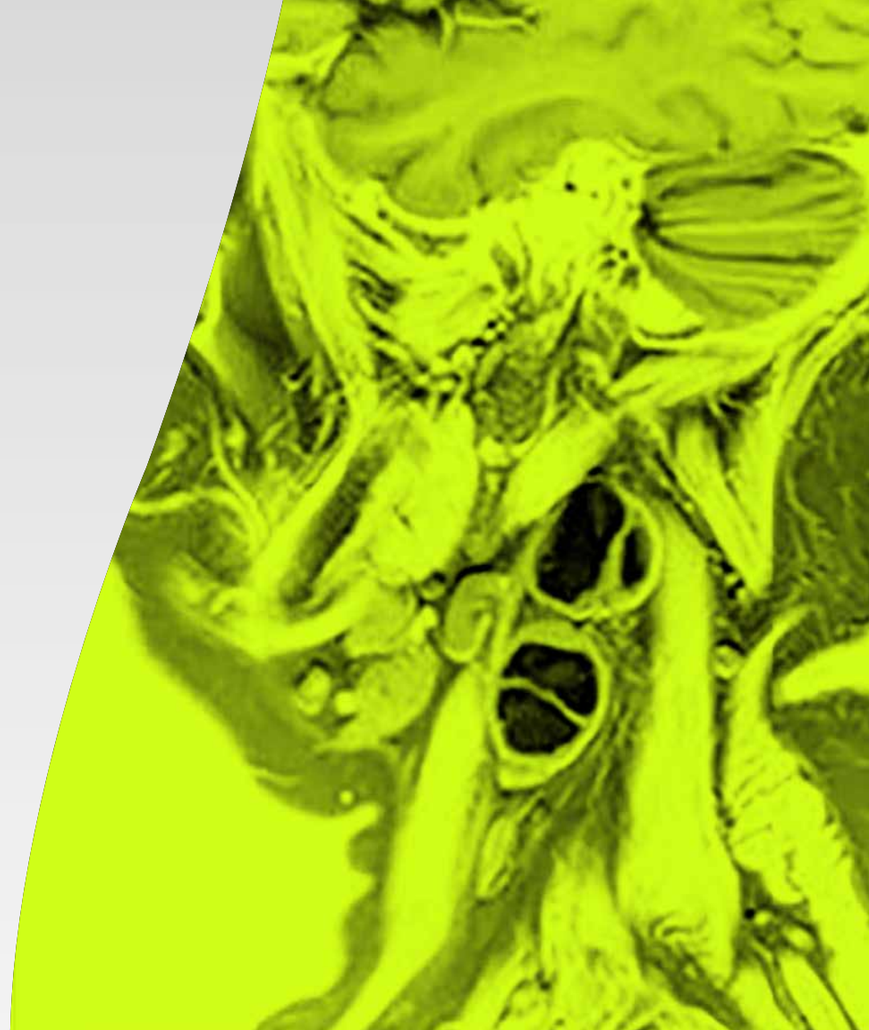
MODERN RADIOLOGY eBook

# Head and Neck Imaging

# 头颈部影像学



ESR EUROPEAN SOCIETY OF RADIOLOGY

# Preface

*Modern Radiology* is a free educational resource for radiology published online by the European Society of Radiology (ESR). The title of this second, rebranded version reflects the novel didactic concept of the ***ESR eBook*** with its unique blend of text, images, and schematics in the form of succinct pages, supplemented by clinical imaging cases, Q&A sections and hyperlinks allowing to switch quickly between the different sections of organ-based and more technical chapters, summaries and references.

Its chapters are based on the contributions of over 100 recognised European experts, referring to both general technical and organ-based clinical imaging topics. The new graphical look showing Asklepios with fashionable glasses, symbolises the combination of classical medical teaching with contemporary style education.

Although the initial version of the ***ESR eBook*** was created to provide basic knowledge for medical students and teachers of undergraduate courses, it has gradually expanded its scope to include more advanced knowledge for readers who wish to 'dig deeper'. As a result, *Modern Radiology* covers also topics of the postgraduate levels of the *European Training Curriculum for Radiology*, thus addressing postgraduate educational needs of residents. In addition, it reflects feedback from medical professionals worldwide who wish to update their knowledge in specific areas of medical imaging and who have already appreciated the depth and clarity of the ***ESR eBook*** across the basic and more advanced educational levels.

I would like to express my heartfelt thanks to all authors who contributed their time and expertise to this voluntary, non-profit endeavour as well as Carlo Catalano, Andrea Laghi and András Palkó, who had the initial idea to create an ***ESR eBook***, and - finally - to the ESR Office for their technical and administrative support.

*Modern Radiology* embodies a collaborative spirit and unwavering commitment to this fascinating medical discipline which is indispensable for modern patient care. I hope that this ***educational*** tool may encourage curiosity and critical thinking, contributing to the appreciation of the art and science of radiology across Europe and beyond.

**Minerva Becker**, Editor
Professor of Radiology, University of Geneva, Switzerland

## Head and Neck Imaging

**CHAPTER OUTLINE:**





## 头颈部影像学

**章节大纲：**



# 前言

*《现代放射学》*是由欧洲放射学协会 (European Society of Radiology, ESR) 在线发布的免费放射学教育资源。第二版（更名版）标题反映了 ***ESR 电子书*** 新颖的教学概念，它以简洁页面的形式巧妙地融合文本、图像和示意图，并辅以临床影像学案例、问答部分和内容超链接，使读者能够在各基于器官的部分、更具技术性的章节、摘要以及参考文献之间快速切换浏览。

其章节以 100 多名公认欧洲专家的优秀稿件为根基，涉及各类一般技术和基于器官的临床影像学主题。同时采用了全新的图形外观，展示了佩戴时尚眼镜的 Asklepios，象征着传统医学教学与现代风格教育的结合。

虽然初版 ***ESR 电子书***旨在为医学生和本科生教师提供医学基础知识，但现已逐渐扩充其知识领域，为希望“深入挖掘”的读者提供了更多高阶技术知识。因此，*《现代放射学》*还涵盖了***欧洲放射学培训课程***研究生水平的各类主题，旨在解决住院医师的研究生教育需求。此外，书中还囊括了全球医疗专业人士的反馈，他们希望更新自己在医学影像特定领域的知识，并对 ***ESR 电子书***在基础和高等教育水平上的深度和清晰度表示高度赞赏。

我要衷心感谢所有为这项非营利活动自愿贡献时间和专业知识的作者，以及最初提出创作 ***ESR 电子书***的 Carlo Catalano、Andrea Laghi 和 András Palkó，最后还要感谢 ESR 办公室所提供的技术和行政支持。

*《现代放射学》*充分体现了医者的协作精神和对这门热门医学学科坚定不移的承诺，这是现代患者护理必须具备的优秀精神品质。我希望这款***教育***工具能够激励各位始终保持好奇心和批判性思维，从而促进整个欧洲乃至欧洲以外地区对放射学艺术和科学的认识。

**Minerva Becker，**编辑
瑞士日内瓦大学放射学教授

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**章节大纲：**

# Translation Credits

This is a translation of the Chapter of the **Modern Radiology eBook.**

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Head and Neck Imaging

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**ENDORSED BY:**
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**NOTE FROM THE COORDINATORS:**
Thank you to Chinese radiology experts for bridging languages and open the world-class English resource by ESR to every Mandarin-speaking student, fueling global radiology talent with a single click


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**CHAPTER OUTLINE:**







**章节大纲：**



# 翻译致谢

本章节为《现代放射学电子书》的部分译文。

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头颈部影像学

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中华医学会放射学分会

**译者寄语：**
感谢中国放射学专家们的倾力奉献！你们跨越了语言的鸿沟，将欧洲放射学会 (ESR) 的世界级学术宝库呈献给广大中文学子。如今，前沿智慧一键即达，为全球放射学人才的蓬勃发展注入了强劲动力。


<↑> 超链接

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# Signage

<-> CORE KNOWLEDGE

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<∞> REFERENCES

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## Head and Neck Imaging

**CHAPTER OUTLINE:**





## 头颈部影像学

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# 导示

<-> 核心知识

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<∞> 参考文献

<?> 问题

MODERN RADIOLOGY eBook

Based on the ESR Curriculum for Radiological Education

# Head and **Neck** Imaging


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## Head and **Neck** Imaging

**CHAPTER OUTLINE:**





## 头 颈部 影像学

**章节大纲：**



基于 **ESR** 课程的放射学教育

# 头 颈部 影像学


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# Chapter Outline

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  - Thyroid Gland
  - Lymph Nodes
  - Temporal Bone
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  - 咽部、喉部和口腔
  - 涎腺
  - 甲状腺
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- 解剖结构变异
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- 影像诊断技术
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  - PET-CT
- 炎症性和感染性病变
  - 鼻窦炎及其并发症
  - 扁桃体炎和扁桃体周围脓肿
  - 涎石病和涎腺炎（包括自身免疫性疾病）
  - 淋巴结炎
  - 中耳乳突炎及其并发症
- 恶性肿瘤
  - 鳞状细胞癌
  - 其他恶性肿瘤
  - 淋巴瘤
  - 甲状腺癌
  - 多学科肿瘤团队
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  - 副神经节瘤
  - 多形性腺瘤
- 外伤
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- 先天性病变
  - 鳃裂囊肿
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- 核心要点
- 参考文献
- 知识测试

# Anatomy



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章节大纲：





# 解剖结构

# / Paranasal Sinuses

These are air-containing sacs communicating with the nasal cavity through narrow, and easily occluded, openings. The maxillary and sphenoid sinuses are present in a rudimentary state at birth. The rest develop by the 8th year of life. All are fully formed at adolescence.

**Frontal sinuses (Figs. 1 and 2):** contained in the frontal bone. They vary greatly in size. Occasionally, one or both may be absent. Their posterosuperior wall lies adjacent to the frontal lobe of the brain. Their floor abuts the ethmoid air cells, the roof of the nasal fossa and the orbit. They drain into the frontal recess, an opening at its inferior aspect and finally drains into the middle meatus via the hiatus semilunaris (**Figs. 1 and 2**). The latter is an opening located in the lateral wall of the nasal cavity (see figure below).

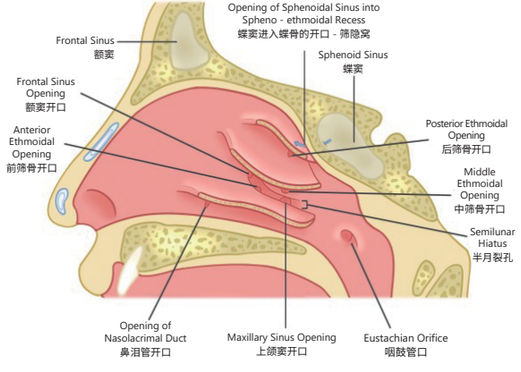
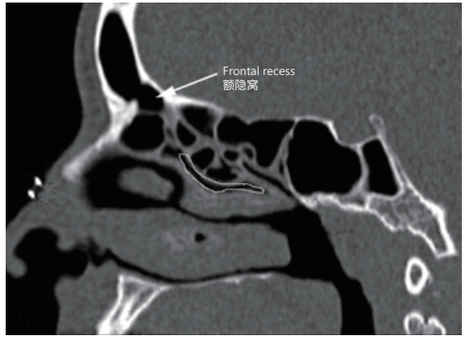



**FIGURE 1**

Schematic diagram of the nasal cavity (sagittal view) with conchae removed to expose the hiatus semilunaris.

**FIGURE 2**

Sagittal reformatted CT image. The frontal sinus drains into the middle meatus via the frontal recess and then hiatus semilunaris (outlined in white). The latter is an opening located in the lateral wall of the nasal cavity.






/ **Head and Neck** Imaging

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**章节大纲：**



# / 鼻旁窦

鼻旁窦为与鼻腔连通的含气囊腔，连通口狭窄且易堵塞。鼻旁窦的上颌窦和蝶窦在出生时处于发育不全状态。其他部分在 8 岁时开始发育，所有部分在青少年期发育完成。

**额窦（图 1 和 2）：**位于额骨中。大小差异很大。在偶尔情况下，单侧或双侧额窦可能缺失。额窦的后上壁与大脑额叶相邻，其底壁与筛窦气房、鼻腔顶壁和眼眶相邻。额窦的分泌物经额隐窝（开口位于下部）引流，最后经半月裂孔流入中鼻道（**图 1 和 2**）。半月裂孔是位于鼻腔外侧壁的一个开口（见下图）。

**图 1**

鼻腔示意图（矢状位视图），已去除鼻甲以显示半月裂孔。

**图 2**

矢状位重建 CT 图像。额窦的分泌物经额隐窝引流，然后经半月裂孔（白色轮廓所示）流入中鼻道。半月裂孔是位于鼻腔外侧壁的一个开口。

**Maxillary sinuses (Figs. 3, 4 and 5):** pyramidal shaped sinus occupying the cavity of the maxilla. The medial wall forms part of the lateral face of the nasal cavity and carries the inferior concha. Above this concha is the opening of the maxillary sinus into the middle meatus in the hiatus semilunaris.

**Ostiomeatal unit (Fig. 4 and 5):** This is a very important anatomical region as it allows drainage of the frontal, anterior ethmoid and maxillary sinuses. It is composed of the superomedial maxillary sinus, maxillary infundibulum, uncinate process, ethmoid bulla, hiatus semilunaris.

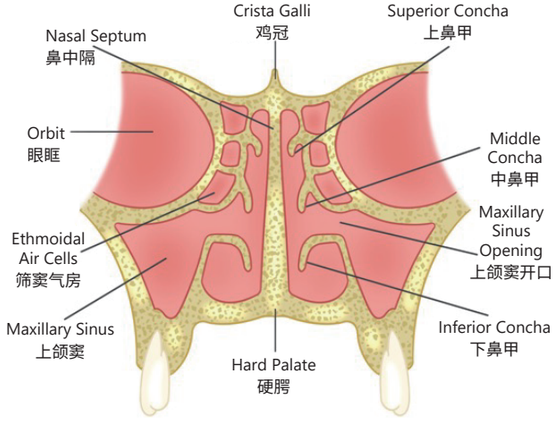


**FIGURE 3**

Schematic diagram of the nasal cavity, maxillary sinus and ethmoid sinuses (coronal view).

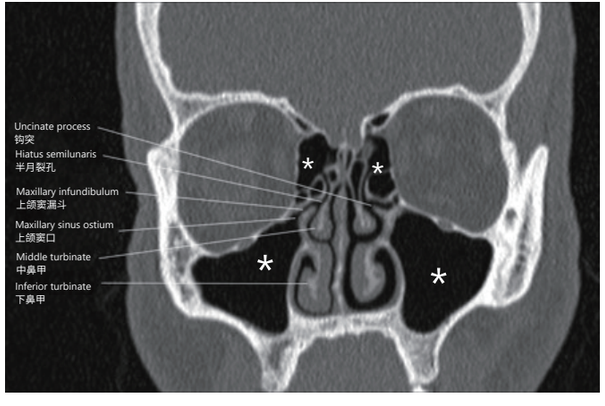


**FIGURE 4**

Coronal CT reformatted image showing the components of the ostiomeatal unit/ complex. Maxillary sinuses (**large asterisks**). Ethmoid sinuses (**small asterisks**).



## Head and Neck Imaging

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**章节大纲：**



**上颌窦（图 3、4 和 5）：**为锥形体鼻窦，占据上颌骨的空腔。其内侧壁构成鼻腔外侧面的一部分，并承载下鼻甲。在下鼻甲上方，上颌窦经半月裂孔开口于中鼻道。

**窦口鼻道复合体（图 4 和 5）：**这是一个极为重要的解剖区域，因为它为额窦、前筛窦和上颌窦提供引流通道。窦口鼻道复合体由上颌窦内上部分、上颌窦漏斗、钩突、筛泡、半月裂孔组成。

**图 3**

鼻腔、上颌窦和筛窦示意图（冠状位视图）。

**图 4**

冠状位 CT 重组图像，显示窦口鼻道复合体的各组成部分。上颌窦（**大星号**）。筛窦（**小星号**）。

The **infraorbital nerve** lies in a groove which bulges into the roof of the sinus (**Fig. 5**). The floor of the sinus carries the roots of the upper premolar and molar teeth. The floor of the sinus corresponds therefore to the alveolar ridge of the maxilla, not the floor of the nasal cavity.

**Ethmoid sinuses:** group of 8-10 air cells within the lateral mass of the ethmoid lying between the side-walls of the upper nasal cavity and the orbits (**Figs. 4 and 5**). Superiorly, they lie on each side of the cribriform plate and are located below the frontal lobe of the brain. They drain into the superior and middle meatus.

**Sphenoid sinuses:** lie within the body of the sphenoid bone on either side of the midline (**Fig. 5**). They vary in size and may extend laterally into the greater wing of the sphenoid bone or backwards into the basal part of the occipital bone. They drain into the nasal cavity above the superior concha via the sphenoethmoidal recess.

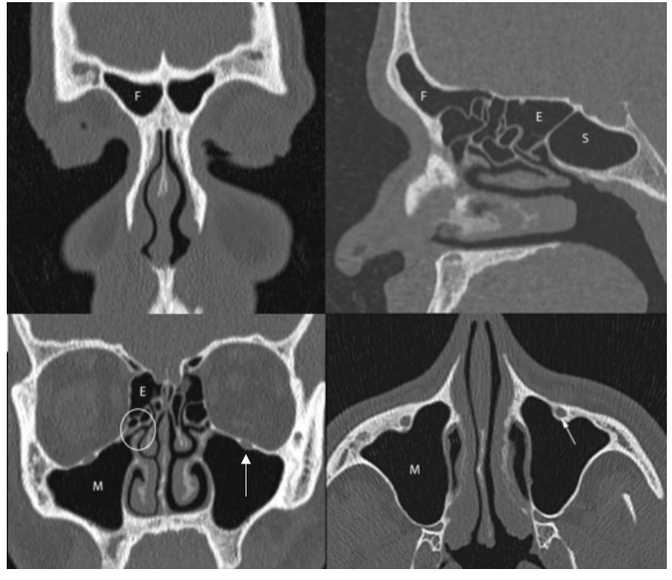


**FIGURE 5**

Multiplanar reformatted CT images of the paranasal sinuses demonstrating the frontal (**F**), ethmoid (**E**), maxillary (**M**) and sphenoid (**S**) sinuses. The ostiomeatal complex is indicated by a circle. Infraorbital nerve (arrow).

**CHAPTER OUTLINE:**









**眶下神经**位于凸入上颌窦顶壁的沟内（**图 5**）。上颌窦底壁承载着上颌前磨牙和磨牙的牙根。因此，上颌窦的底壁对应上颌骨的牙槽嵴，而非鼻腔的底壁。

**筛窦：**筛窦是位于筛骨外侧块内的一组含气小房，由 8~10 个气房组成，处于鼻腔上部的侧壁与眼眶之间（**图 4 和 5**）。在上方，它们位于筛板的两侧、大脑额叶的下方。筛窦的分泌物流入上鼻道和中鼻道。

**蝶窦：**位于蝶骨体内、中线两侧（**图 5**）。蝶窦大小各异，可向外延伸至蝶骨大翼，或向后延伸至枕骨的基底部。它们的分泌物经蝶筛隐窝引流，流入上鼻甲上方的鼻腔部位。

**章节大纲：**



**图 5**

鼻旁窦的多平面重建 CT 图像，显示额窦 (**F**)、筛窦 (**E**)、上颌窦 (**M**) 和蝶窦 (**S**)。窦口鼻道复合体用圆圈表示。眶下神经（箭头）。

# / Pharynx, Larynx & Oral Cavity

## / Pharynx

**Pharynx:** Is a musculofascial tube extending from the skull base to the oesophagus. It is made up of three portions (**Figs. 6 and 7**):

- **Nasopharynx (NP)** situated behind the nasal fossae and above the soft palate. It is directly continuous anteriorly with the nasal cavity.
- **Oropharynx** lying behind the mouth, situated between the soft palate and the base of the tongue (it includes the uvula). It forms part of the upper respiratory tract and the gastrointestinal tract. On axial images, the C1/C2 junction is generally accepted as the level of demarcation between NP and oropharynx (Dubrulle et al. 2007).
- **Hypopharynx (also called laryngopharynx)** – lies behind the larynx. It is the inferior continuation of the oropharynx.

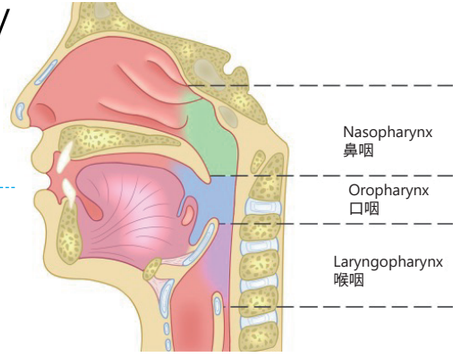


**FIGURE 6**

Schematic diagram of the pharynx and its subdivisions into nasopharynx, oropharynx and laryngopharynx.

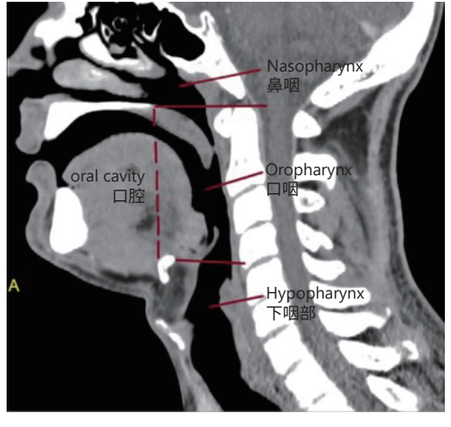


**FIGURE 7**

Sagittal reformatted CT of the neck after contrast administration showing the different subdivisions of the pharynx and the oral cavity.



**Head and Neck Imaging**

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**头颈部影像学**

**章节大纲：**



# / 咽部、喉部和口腔

## / 咽部

**咽部：**是一个肌筋膜管，从颅底延伸至食管。它由三个部分组成（图 6 和 7）：

- **鼻咽 (NP)** 位于鼻腔后方、软腭上方，向前与鼻腔直接相延续。
- **口咽**位于口腔后方，处于软腭与舌基底部之间（包括悬雍垂）。它是上呼吸道和胃肠道的一部分。在轴位图像上，C1/C2 交界处通常被认为是鼻咽 (NP) 和口咽的分界平面 (Dubrulle et al.2007)。
- **下咽（也称为喉咽）：**位于喉部后方，是口咽向下方的延续。

**图 6**

咽部及其细分部分（鼻咽、口咽和喉咽）的示意图。

**图 7**

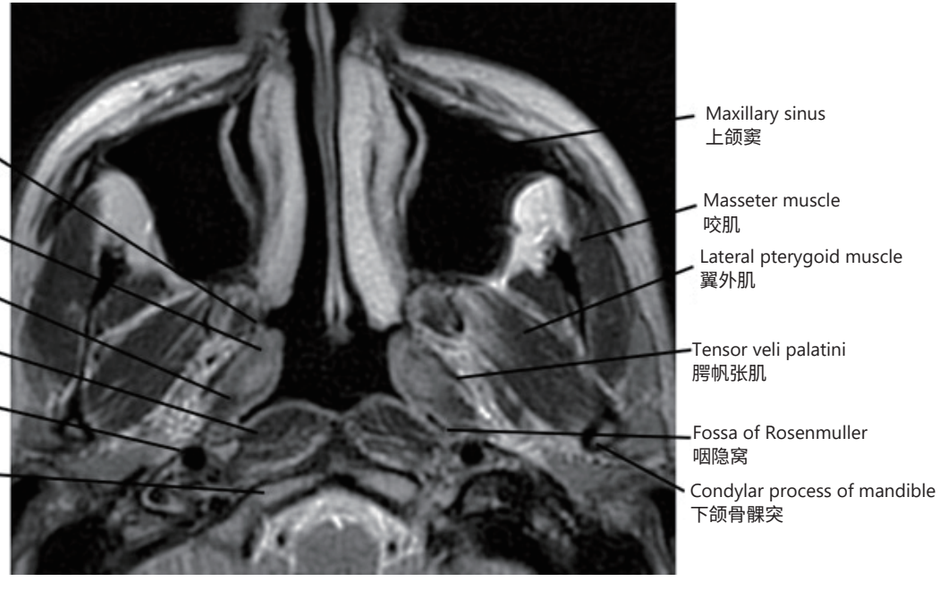
使用造影剂后颈部的矢状位重建 CT 图像，显示咽部的不同细分部分和口腔。

The **nasopharynx** (NP) is an inverted J-shaped muscular aponeurotic sling suspended from the central skull base (Teresi et al. 1987).

Superior border: basisphenoid and clivus; Inferior border: lower border of the soft palate (C1); Anterior border: nasal choane; Posterior border: retropharyngeal space and prevertebral space; Lateral border: parapharyngeal space (pharyngobasilar membrane). See **Fig. 8**.

**FIGURE 8**

Axial T2 weighted MR image showing the anatomy of the NP and surrounding structures.






**Head and Neck Imaging**

**CHAPTER OUTLINE:**







**头颈部影像学**

**章节大纲：**



鼻咽 (NP) 是一个倒 J 形的肌性腱膜吊带，悬挂于中央颅底 (Teresi et al.1987)。

上界：蝶骨体和斜坡；下界：软腭下缘 (C1)；前界：鼻后孔；后界：咽后间隙和椎前间隙；外侧界：咽旁间隙（咽颅底膜）。见图 **8**。

**图 8**

轴位 T2 加权 MR 图像，显示鼻咽 (NP) 及周围结构的解剖。

The **nasopharynx** (**Figs. 6, 7 and 9**) Is the portion of the pharynx between the nasopharynx above and hypopharynx below.

Boundaries: superiorly level of the soft palate, inferiorly level of hyoid bone or tip of epiglottis and laterally tonsillar fossae

The oropharynx includes the base of the tongue (posterior third) and the lingual tonsils, the palatine tonsils, the inferior surface of the soft palate, the uvula, the valleculae and posterior pharyngeal wall.

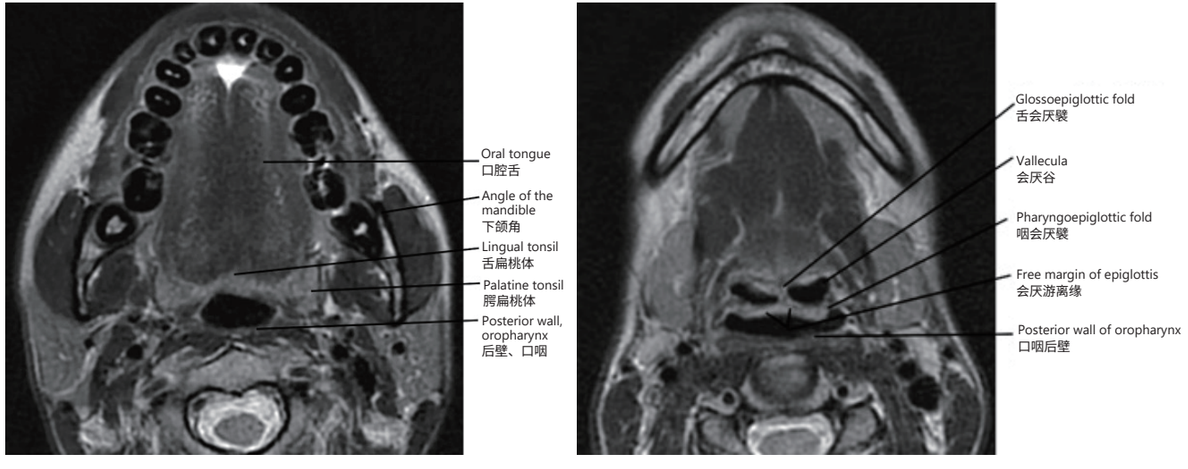



**FIGURE 9**

Axial T2W MR Images at the level of the oropharynx. At the inferior margin of the oropharynx, the free margin of epiglottis, glossoepiglottic fold, and pharyngoepiglottic fold are seen.





**CHAPTER OUTLINE:**









**章节大纲：**



鼻咽（图6、7 和 9）是咽部的一部分，位于上方的鼻咽和下方的喉咽之间。

边界：上界为软腭平面，下界为舌骨平面或会厌尖平面，外侧为扁桃体窝

口咽包括舌基底部（后 1/3）、舌扁桃体、腭扁桃体、软腭下面、悬雍垂、会厌谷和咽后壁。

**图 9**

口咽水平的轴位 T2W MR 图像。在口咽下缘，可见会厌游离缘、舌会厌襞和咽会厌襞。

The **hypopharynx** is a mucosa-lined, muscular tube which is located posterior to the larynx, medial to the carotid spaces bilaterally, and ventral to the retropharyngeal space (**Figs. 6, 7 and 10**).

The hypopharynx begins as the continuation of the oropharynx at the pharyngoepiglottic fold (which is at the level of the hyoid bone) and extends inferiorly to the level of the inferior aspect of the cricoid cartilage, from where it continues as the cervical esophagus. The hypopharynx has three subsites: the pyriform sinuses, the posterior wall and the retro-cricoid portion.

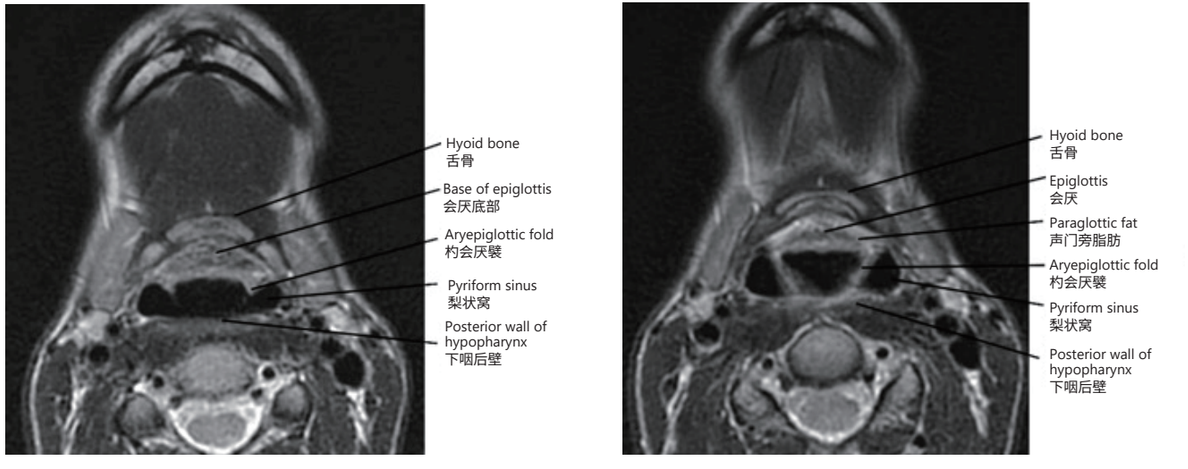



**FIGURE 10**

Axial T2W MR images show the most cranial portions of the hypopharynx. The aryepiglottic folds separate the funnel-shaped vestibule of the larynx (asterisk) from the piriform sinuses.



**Head and Neck Imaging**

**CHAPTER OUTLINE:**







**头颈部影像学**

**章节大纲：**



下咽是一个由黏膜衬里的肌性管道，位于喉后部、双侧颈动脉间隙内侧和咽后间隙腹侧（图 6、7 和 10）。

下咽起自咽会厌皱襞处（平舌骨水平）的口咽延续部分，向下延伸至环状软骨下缘水平，自此向下延续为颈段食管。下咽有三个亚区：梨状窝、后壁和环后区。

**图 10**

轴位 T2W MR 图像，显示下咽的最颅侧部分。杓会厌襞将喉的漏斗状前庭（星号）与梨状窝分隔开。

# / Larynx

**Larynx (Fig. 11):** is an inferior continuation of the oropharynx. It extends from the epiglottis to the inferior aspect of the cricoid cartilage. Inferiorly, it continues as the cervical trachea. The larynx is part of the upper respiratory tract.

The larynx consists of the laryngeal cartilages (thyroid, cricoid, arytenoids and epiglottis, which make up the laryngeal skeleton), the false cords and the true vocal cords with the mucosa overlying them, as well as ligaments and muscles holding these structures together.

The larynx has three subsites: the supraglottis, the glottis and the subglottis (**Figs. 12-14**).

Anteriorly to the larynx are the strap muscles, posteriorly, the oesophagus and the hypopharynx, superiorly the hyoid bone and inferiorly the trachea.

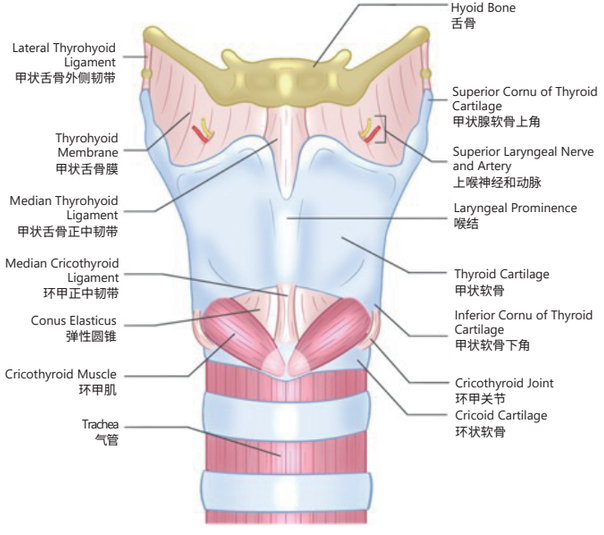



**FIGURE 11**

Schematic drawing of the larynx (anterior view).





**CHAPTER OUTLINE:**









**章节大纲：**



# / 喉部

喉部（图 11）：是口咽的下方延续部分，从会厌延伸至环状软骨的下缘。在下方，它延续为颈部气管。喉部是上呼吸道的一部分。

喉部由喉软骨（甲状软骨、环状软骨、杓状软骨和会厌，这些构成喉部的支架）、假声带和真声带（其表面覆盖有黏膜），以及将这些结构连接在一起的韧带和肌肉组成。

喉部有三个亚区：声门上区、声门区和声门下区（图12～14）。

喉部前方是带状肌，后方是食管和下咽，上方是舌骨，下方是气管。

**图 11**

喉部示意图（前视图）。

**Supraglottis (Fig. 12):** extends from the tip of the epiglottis to the laryngeal ventricle and consists of the following:

- Epiglottis with the suprahyoid and infrahyoid portions
- Pre-epiglottic and paraglottic space
- Arytenoid cartilages
- Aryepiglottic folds
- False vocal cords

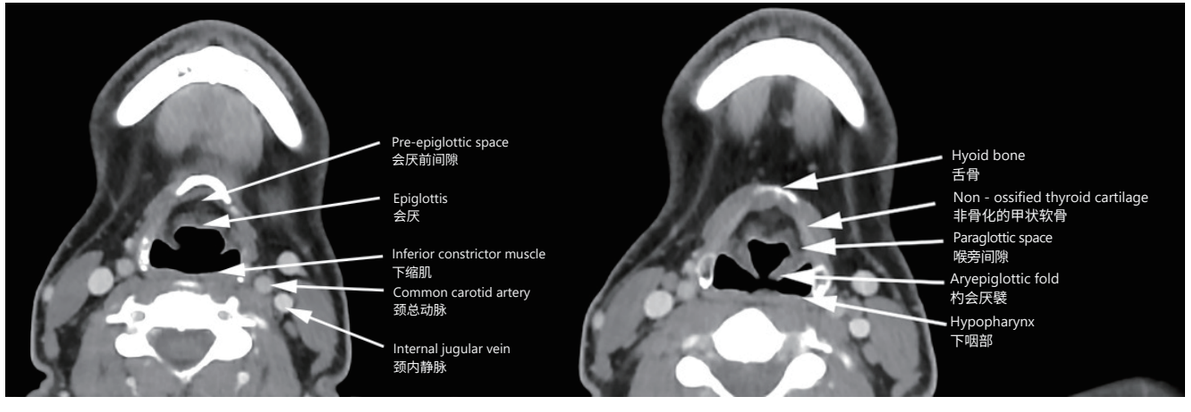



**FIGURE 12**

Axial contrast enhanced CT images at the level of the supraglottis.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



声门上区（图 12）：从会厌尖延伸至喉室，由以下部分组成：

- 会厌（含会厌上份和会厌下份）
- 会厌前间隙和喉旁间隙
- 杓状软骨
- 杓会厌襞
- 假声带

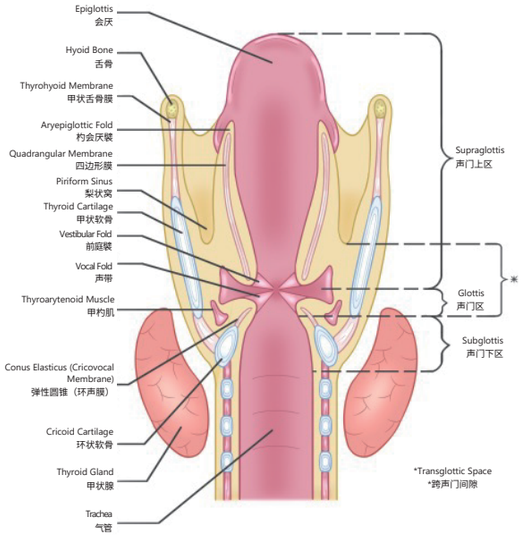
**图 12**

声门上区水平的轴位增强 CT 图像。

**Glottis (Fig. 13):** Anatomic subsite of larynx between supraglottis and subglottis. It comprises:

- True vocal cords
- Anterior commissure
- Posterior commissure

The glottis is bound superiorly by upper surface of true vocal cord and laterally by the paired paraglottic spaces. Inferiorly, it extends 1cm below the upper surface of the true vocal cords.



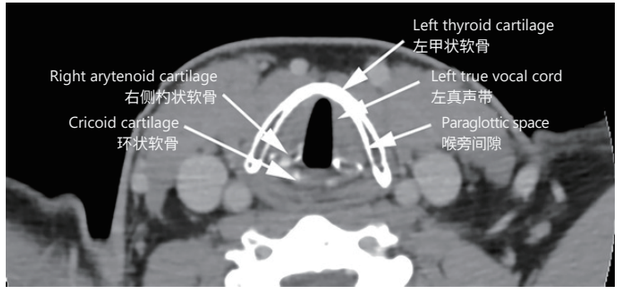




**FIGURE 13**

Schematic drawing of the inner structures of the larynx (coronal view) and axial contrast enhanced CT image at the level of the glottis. This CT image was obtained in quiet breathing (abducted vocal cords).





**CHAPTER OUTLINE:**









**章节大纲：**



声门区（图 13）：声门上区和声门下区之间的解剖亚区。其包括：

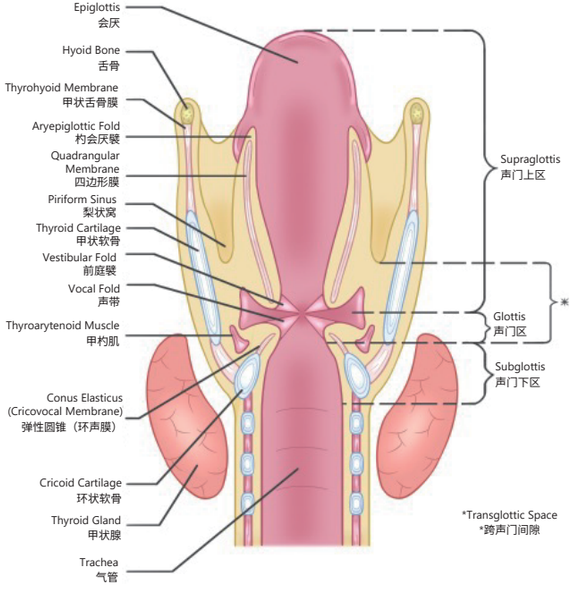
- 真声带
- 前连合
- 后连合

声门上界为真声带的上表面，外侧以成对的喉旁间隙为界。在下方，它延伸至真声带上表面下方 1 cm 处。

**图 13**

喉部内部结构示意图（冠状位视图）以及声门水平的轴位增强 CT 图像。该 CT 图像是在平静呼吸（声带外展）状态下获取。

**Subglottis (Fig. 14):** Extends from inferior surface of true vocal cords to the inferior surface of cricoid cartilage.



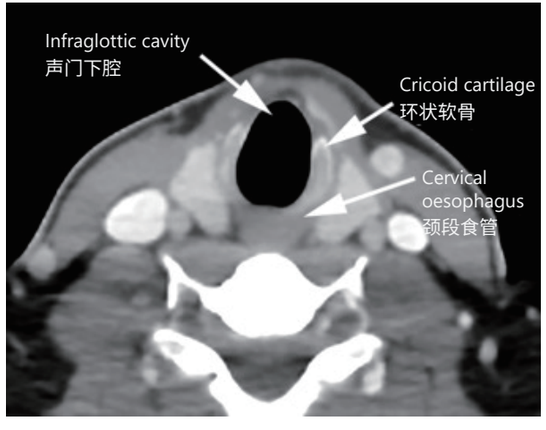




**FIGURE 14**

Schematic drawing of the inner structures of the larynx (coronal view) and axial contrast enhanced CT image at the level of the subglottis (also called infraglottis).





**CHAPTER OUTLINE:**









**章节大纲：**



声门下区（图 14）：从真声带下表面延伸到环状软骨下表面。

**图 14**

喉部内部结构示意图（冠状位视图）以及声门下区（也称为声门下部）水平的轴位增强 CT 图像。

# / Oral Cavity

**Oral cavity (Fig. 15):** also referred to as the mouth is directly continuous with the oropharynx posteriorly.

It is made of the following anatomical structures:

- / upper and lower lip
- / buccal mucosa (cheek)
- / upper and lower alveolar ridge (gums)
- / hard palate
- / anterior two thirds of the tongue
- / floor of mouth (includes oral cavity mucosa lining the floor of mouth and mylohyoid sling)
- / retromolar trigone (mucosal surface behind the lower third molar tooth)

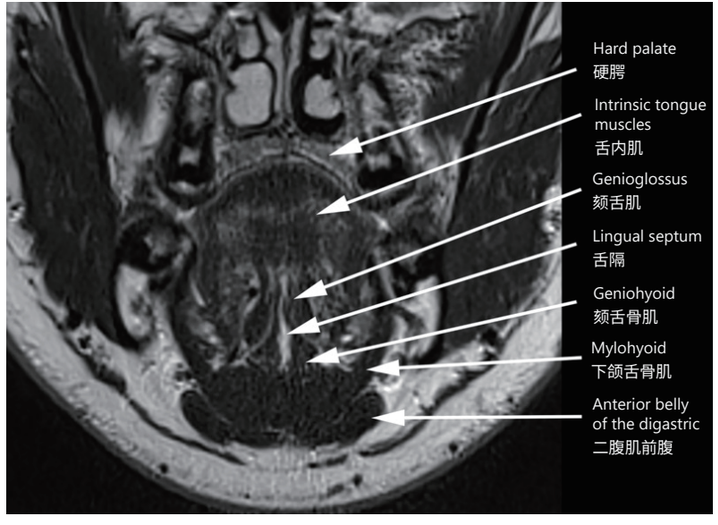



**FIGURE 15**

Coronal T2W MR image of the oral cavity.





**CHAPTER OUTLINE:**









# / 口腔

**口腔（图 15）：**也称为嘴部，向后与口咽直接相连。

由以下解剖结构组成：

- / 上下唇
- / 颊黏膜（脸颊）
- / 上下牙槽嵴（牙龈）
- / 硬腭
- / 舌前三分之二
- / 口底（包括衬于口底的口腔黏膜和下颌舌骨肌吊带）
- / 磨牙后三角（下颌第三磨牙后方的黏膜表面）

**章节大纲：**



**图 15**

口腔的冠状位 T2W MR 图像。

# / Parotid, Submandibular & Sublingual Glands

## / Parotid Gland

**Parotid gland (Figs. 16 and 17):** It is the largest salivary gland in the body. It is composed of adipose and glandular tissue in nearly equal portions.

Is located posterolateral to the ascending ramus of the mandible, masseter and medial pterygoid muscle and lateral to the common carotid artery (CCA) and internal jugular vein (IJV).

It contains the facial nerve, auriculotemporal branches of the mandibular nerve (CN V3), lymph nodes, the external carotid artery and retromandibular vein. The parotid duct (Stenson's duct) opens into the mouth on a small papilla, opposite the upper 2nd molar tooth.

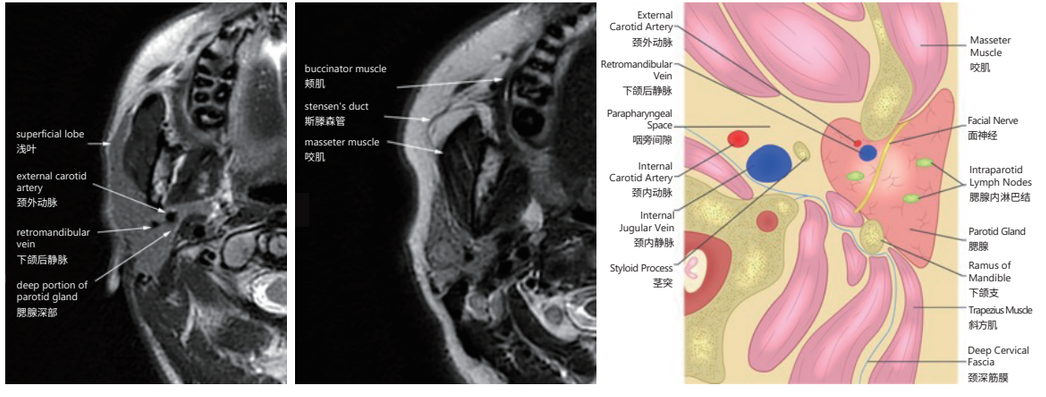



**FIGURE 16**

Axial T2W MR images at the level of the right parotid gland and a schematic illustration of the pertinent anatomic structures within and surrounding the left parotid gland.



/ **Head** and **Neck** Imaging

**CHAPTER OUTLINE:**







# / 腮腺、下颌下腺和舌下腺

## / 腮腺

腮腺（图 16 和 17）：腮腺是人体最大的涎腺，由脂肪组织和腺体组织构成，二者占比几乎相等。

腮腺位于下颌升支、咬肌和翼内肌后外侧，颈总动脉 (CCA) 和颈内静脉 (IJV) 外侧。

包含面神经、下颌神经的耳颞支 (CN V3)、淋巴结、颈外动脉和下颌后静脉。腮腺导管（斯滕森管）开口于口腔内的一个小乳头，正对上颌第二磨牙。

/ 头颈部影像学

章节大纲：



**图 16**

右侧腮腺水平的轴位 T2W MR 图像，以及左侧腮腺内部和周围相关解剖结构的示意图。

Parotid Gland:

It develops before the submandibular and sublingual glands but is the last to encapsulate.

**<!> ATTENTION**

Explains why lymph nodes occur in the parotid gland but not in the other salivary glands.

This unique feature of the parotid gland has implications > predilection to develop lymphatic pathology.

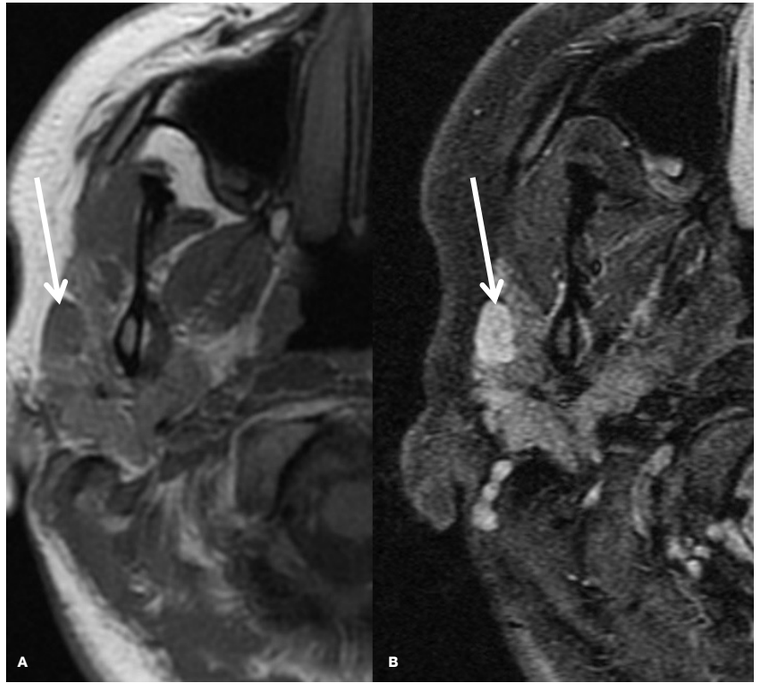



**FIGURE 17**

Axial T1W MR image (A) and corresponding contrast-enhanced fat saturated T1 weighted (T1W FS + C) image (B) show a slightly enlarged, enhancing lymph node (arrows) in the right parotid gland. Histology revealed follicular lymphoma.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



腮腺：

发育早于下颌下腺和舌下腺，却是最后被包膜包裹。

**<!> 注意**

这解释了为什么淋巴结存在于腮腺中，而不存在于其他涎腺中。

腮腺的这一独特特征具有以下意义：易发生淋巴系统疾病。

**图 17**

轴位 T1W MR 图像 (A) 和相应的增强脂肪饱和与 T1 加权 (T1W FS + C) 图像 (B)，显示右侧腮腺有轻度增大的增强淋巴结（箭头）。组织学检查证实为滤泡性淋巴瘤。

# / Submandibular and Sublingual Glands

**Submandibular glands (Fig. 18):** are paired glands located behind and below the ascending ramus of the mandible. They secrete mixed serous and mucous saliva that is excreted into the oral cavity via the submandibular duct (Wharton's duct) that connects the gland to the floor of mouth.

**Sublingual glands (Fig. 18):** are the smallest of the three major salivary glands. They are situated deep to the body of the mandible in the sublingual space. They are composed of a major sublingual gland and 8–30 small minor sublingual glands. The sublingual duct (duct of Bartholin) drains the major sublingual gland into Wharton's duct. Multiple tiny ducts of Rivinus drain the minor sublingual glands into the floor of the mouth.

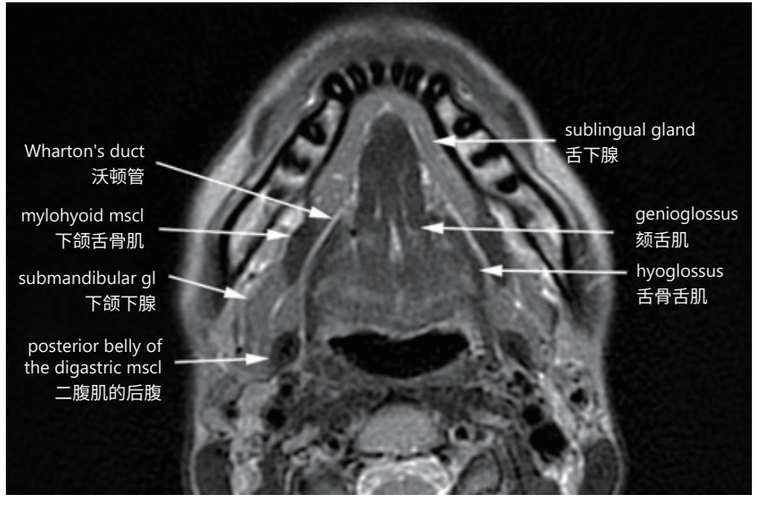



**FIGURE 18**

Axial T2W image shows both the sublingual and submandibular glands.



**CHAPTER OUTLINE:**







章节大纲：



# / 下颌下腺和舌下腺

下颌下腺（图 18）：为成对腺体，位于下颌升支的后方和下方。它们分泌浆液与黏液混合的唾液，经下颌下腺导管（沃顿管）排入口腔，该导管连接腺体与口底。

舌下腺（图 18）：是三大涎腺中最小的腺体，位于舌下间隙内、下颌体深部。由一个较大的舌下腺和 8～30 个较小的舌下腺组成。舌下腺导管（巴林多管）将舌下大腺的分泌物排入沃顿管。里维努斯小管（多个细小导管）则将这些较小的舌下腺的分泌物排入口底。

**图 18**

轴位 T2W 图像，显示舌下腺和下颌下腺。

# / Thyroid Gland

**The thyroid gland (Fig. 19)** is a single midline endocrine organ in the anterior neck responsible for thyroid hormone production. It extends from C5 to T1 and lies anterior to the thyroid and cricoid cartilages of the larynx and the first five or six tracheal rings.

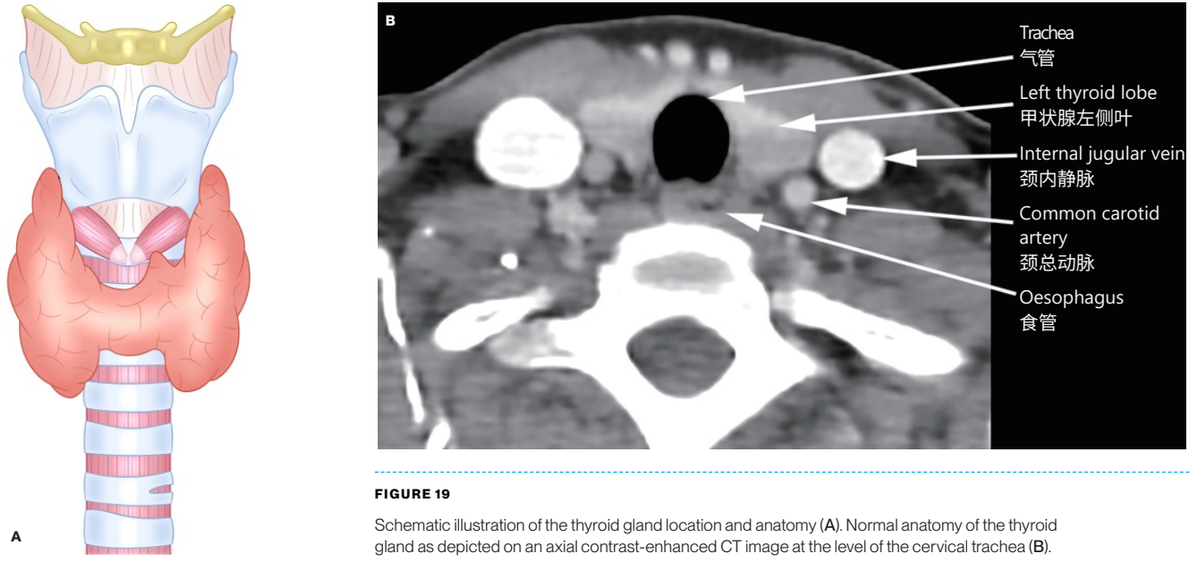



**FIGURE 19**

Schematic illustration of the thyroid gland location and anatomy (**A**). Normal anatomy of the thyroid gland as depicted on an axial contrast-enhanced CT image at the level of the cervical trachea (**B**).





**CHAPTER OUTLINE:**









# / 甲状腺

**甲状腺（图 19）**是颈部前方正中线处的单个内分泌器官，负责甲状腺激素的分泌。它从 C5 延伸至 T1，位于喉部的甲状软骨、环状软骨以及气管的前五个或六个气管环的前方。

**章节大纲：**



**图 19**

甲状腺位置和解剖示意图 (**A**)。颈部气管水平轴位增强 CT 图像上所显示的甲状腺正常解剖结构 (**B**)。

**Thyroid gland (Fig. 20):** is butterfly-shaped and is composed of two lobes, each with a superior and inferior pole. These lobes are connected in the midline via a narrow isthmus which is adherent to the 2nd to 4th tracheal rings.

The parathyroid glands lie posteromedially and are sometimes intracapsular.

The thyroid gland is related to the strap muscles anteriorly, and to the thyroid cartilage, cricoid cartilage and trachea posteriorly. Posteromedially, it abuts the tracheo-esophageal groove (containing lymph nodes, the recurrent laryngeal nerve and the parathyroid glands), whilst posterolaterally it is related to the common carotid artery and internal jugular vein.

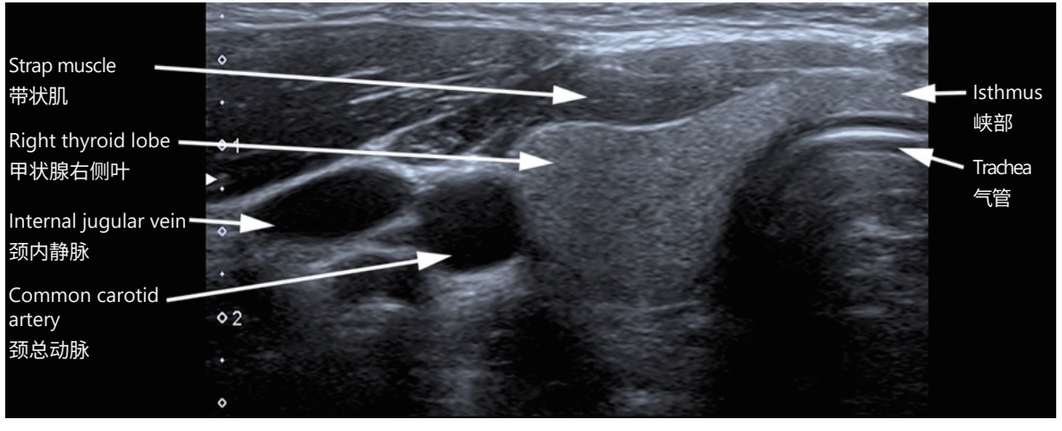



**FIGURE 20**

Axial ultrasound image illustrating the normal anatomy of the thyroid gland. Note that the normal gland has a slightly higher echogenicity compared to the strap muscles.









**甲状腺（图 20）：** 呈蝴蝶状，由两个侧叶组成，每个侧叶都可分为上极和下极。两侧叶通过一条狭窄的峡部在中线处相连，峡部与第 2 至第 4 气管环相贴附。

甲状旁腺位于甲状腺后内侧，有时位于被膜内。

甲状腺前方与带状肌相邻，后方与甲状软骨、环状软骨和气管相邻。在后内侧，甲状腺紧邻气管食管沟（内有淋巴结、喉返神经和甲状旁腺）；在后外侧，甲状腺与颈总动脉 (CCA) 和颈内静脉 (IJV) 相邻。

**图 20**

轴位 US 图像，显示甲状腺的正常解剖结构。注意，与带状肌群相比，正常甲状腺腺体的回声略高。

# / Lymph Nodes

There are several groups of lymph nodes in the neck divided according to their location (**Fig. 21**) as follows:

**Submental/level IA:** anteromedial between the anterior bellies of both digastric muscles

**Submandibular/level IB:** posterolateral to the anterior belly of the digastric muscles

**Upper internal jugular (deep cervical) chain/level II:**

- Cranio-caudal extent: from the base of the skull at the jugular fossa to the inferior border of the hyoid bone.
- Antero-posterior extent: From the posterior border of the submandibular gland to the posterior border of the sternocleidomastoid muscle.
- Medial extent: to the medial border of the internal carotid artery.

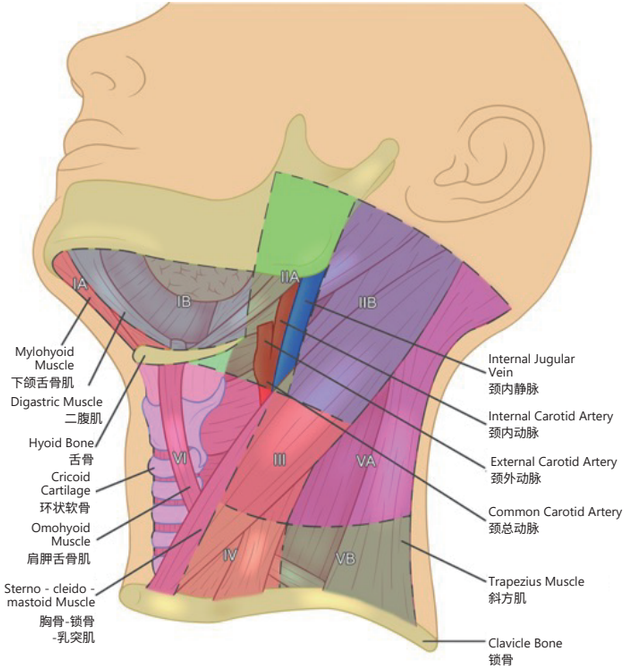



**FIGURE 21**

Schematic diagram demonstrating the cervical lymph node levels in relation to important anatomical landmarks.





**CHAPTER OUTLINE:**









# / 淋巴结

**章节大纲：**



颈部的淋巴结依据位置可分为若干组（图 21），具体如下：

**颏下组/IA 区：**位于二腹肌前腹之间的前内侧区域

**下颌下组/IB 区：**位于二腹肌前腹后外侧

**颈内静脉上组（颈深）链/II 区：**

- 头尾范围：从颈静脉窝处的颅底至舌骨下缘。
- 前后范围：从下颌下腺后缘至胸锁乳突肌后缘。
- 内侧范围：至颈内动脉内侧缘。

**颈内静脉中组（颈深）链/III 区：**

- 头尾范围：从舌骨下缘至环状软骨下缘。
- 前后范围：从胸锁乳突肌前缘至胸锁乳突肌后缘。
- 内侧范围：至颈总动脉 (CCA) 内侧缘。

**图 21**

颈部淋巴结分区与重要解剖标志的关系示意图。

### Middle internal jugular (deep cervical) chain/level III:

/ Cranio-caudal extent: from the inferior border of the hyoid bone to the inferior border of the cricoid cartilage.

/ Antero-posterior extent: from the anterior border of the sternocleidomastoid muscle to the posterior border of the sternocleidomastoid muscle.

/ Medial extent: to the medial border of the common carotid artery.

### Lower internal jugular (deep cervical) chain/level IV:

/ Cranio-caudal extent: from the inferior border of the cricoid cartilage to the level of the clavicle.

/ Antero-posterior extent: from the anterior border of the sternocleidomastoid to the posterolateral edge of the sternocleidomastoid muscle and lateral edge of the anterior scalene muscle.

/ Medial extent: to the medial border of the common carotid artery. This includes the supraclavicular nodes including Virchow node.

### Posterior triangle/level V:

/ Cranio-caudal extent: from the level of the skull base at the apex of the convergence of sternocleidomastoid and trapezius muscles to the level of the clavicle.

/ Antero-posterior extent: from the posterior border of the sternocleidomastoid muscle to the anterior border of the trapezius muscle.

### Central (anterior) compartment/level VI:

/ Cranio-caudal extent: from the inferior border of hyoid bone to the superior border of manubrium (suprasternal notch).

/ Antero-posterior extent: from the the platysma muscle, to the trachea (medially) and prevertebral muscles (laterally).

/ Lateral extent: to the medial borders of both common carotid arteries.

### 颈内静脉下组（颈深）链/IV 区：

/ 头尾范围：从环状软骨下缘至锁骨水平。

/ 前后范围：从胸锁乳突肌前缘至胸锁乳突肌后外侧缘和前斜角肌外侧缘。

/ 内侧范围：至颈总动脉 (CCA) 内侧缘。包括锁骨上淋巴结，包括魏尔啸淋巴结。

### 颈后三角/V 区：

/ 头尾范围：从胸锁乳突肌与斜方肌交汇顶点处的颅底水平至锁骨水平。

/ 前后范围：从胸锁乳突肌后缘至斜方肌前缘。

### 中央（前）室/VI 区：

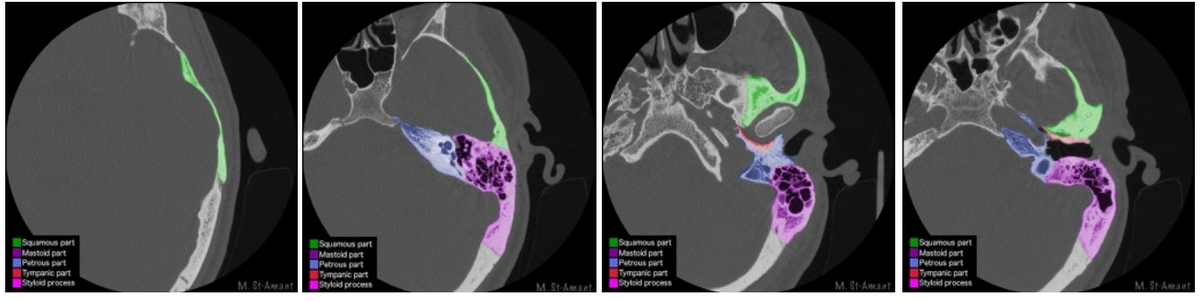
/ 头尾范围：从舌骨下缘至胸骨柄上缘（胸骨上切迹）。

/ 前后范围：从颈阔肌至气管（内侧）和椎前肌（外侧）。

/ 外侧范围：至双侧颈总动脉 (CCA) 内侧缘。

# / Temporal Bones

The temporal bone is composed of four parts (**Fig. 22**):




**Squamous part (temporal squama):** forms the lateral wall of the middle cranial fossa and is separated from the parietal bone by the squamosal suture. Its zygomatic process contributes to the zygomatic arch and the squamosal portion bears the mandibular fossa. This together with the petrous portion of the temporal bone forms the bony portion of the Eustachian tube.

**Petrous portion:** this is divided into the petrous apex and base. The petrous apex articulates with the posterior part of the greater wing of the sphenoid and basilar occiput. It also houses the internal carotid artery. The base directly fuses with the squamous and mastoid portions. It houses the otic capsule or bony labyrinth which surrounds the membranous labyrinth of the inner ear (cochlea, vestibule, semicircular canals).

**Tympanic portion:** is situated inferior to the squamous part and in front of the mastoid bone. Its anterior surface forms the posterior part of the mandibular fossa. Anteriorly it is continuous with the squamous part of the temporal bone.

**Mastoid portion:** is usually considered a separate entity but it is formed by both the squamous and petrous parts. It is the posterior component of the temporal bone. The inferior conical part is called the mastoid process. The styloid process passes inferiorly from the base of the petrous bone and the stylomastoid foramen lies behind the styloid process transmitting the facial nerve.

**FIGURE 22**

Axial CT images of the normal temporal bone. Case courtesy of Maxime St-Amant, https://radiopaedia.org/?lang=us">Radiopaedia.org
From the case https://radiopaedia.org/cases/55609?lang=us">rID:55609



/ **Head** and **Neck** Imaging

**CHAPTER OUTLINE:**







/ 头颈部影像学

# / 颞骨

**章节大纲：**



颞骨由四个部分组成（图 22）：

鳞状部（颞鳞）：构成颅中窝的外侧壁，借鳞状缝与顶骨分开。其颧突参与构成颧弓，鳞状部有下颌窝。颞骨的这部分构成了咽鼓管的骨性部分。

岩部：分为岩尖和岩基。岩尖与蝶骨大翼的后部及枕骨基底部相关节，内有颈内动脉走行。岩基直接与鳞状部和乳突部融合，内有膜迷路（耳蜗、前庭、半规管）的骨性包囊（骨迷路）。

鼓部：位于鳞状部下方、乳突前方。其前面构成下颌窝的后部，向前与颞骨鳞状部相延续。

乳突部：通常被视为一个独立结构，但由鳞状部和岩部共同形成，是颞骨的后部组成部分。岩部下方的锥形部分称为乳突。茎突从颞骨岩部基底部向下延伸，茎乳孔位于茎突后方，有面神经通过。

**图 22**

正常颞骨的轴位 CT 图像。病例由 Maxime St-Amant 提供，网址：https://radiopaedia.org/?lang=us">Radiopaedia.org
病例来源：https://radiopaedia.org/cases/55609?lang=us">rID:55609

The temporal bone can also be divided into three otologic regions: the outer ear, the middle ear and the inner ear (**Figs. 23-29**).

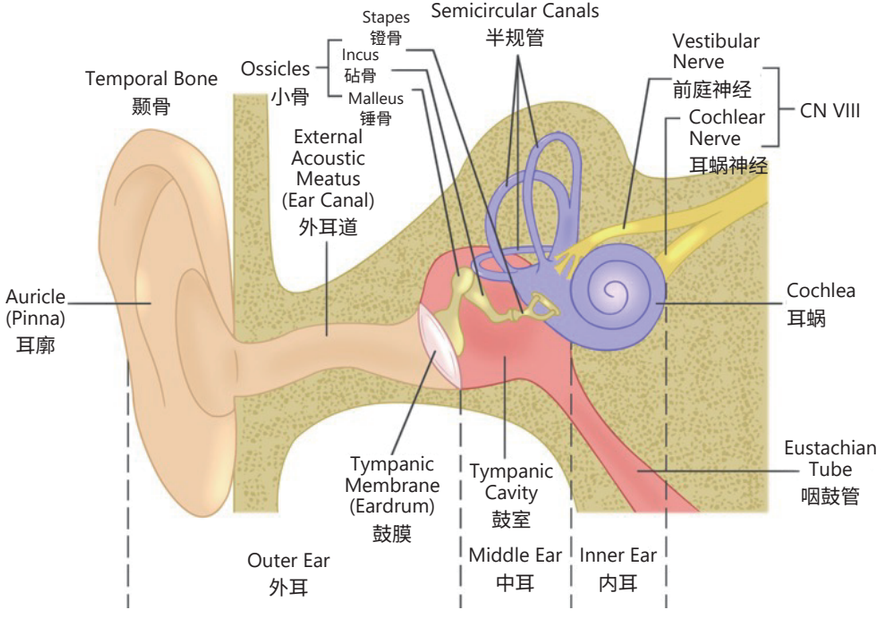



**FIGURE 23**

Schematic drawing of the three otologic temporal bone regions.





**CHAPTER OUTLINE:**









颞骨也可分为三个耳科学区域：外耳、中耳和内耳（图 23~29）。

**章节大纲：**



**图 23**

颞骨三个耳科学区域的示意图。

- **External auditory canal:** It is usually 2.5cm long and S-shaped. The lateral third is bound by a fibrocartilaginous tube continuous with the external ear. The medial two thirds is surrounded by bone and arises from the tympanic and squamous portions of the temporal bone.
- **Middle ear also known as tympanic cavity:** this is an air-filled compartment in the petrous temporal bone, separated from the external ear by the tympanic membrane and from the inner ear by the medial wall of the tympanic cavity. It contains the auditory ossicles.
- **Inner ear and internal auditory canal:** The inner ear refers to the bony labyrinth, the membranous labyrinth and their contents. It is divided into three parts, the cochlea, vestibule and semicircular canals.

**Figures 24 A-C** illustrate the normal anatomy of the main anatomic structures of the peripheral auditory apparatus.

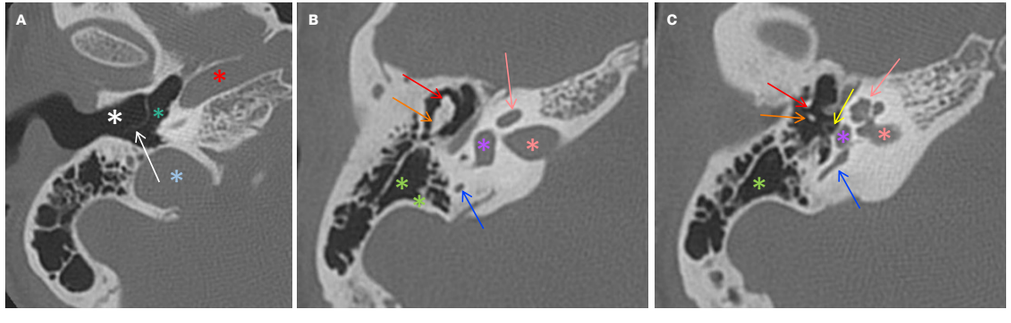



**FIGURE 24**

**A-C.** Axial high-resolution CT slices of the temporal bone. External auditory canal (white asterisk), tympanic membrane (white arrow), middle ear (green asterisk), internal carotid artery (red asterisk), internal jugular vein (blue asterisk), malleus (red arrows), incus (orange arrows), stapes (yelow arrow), cochlea (pink arrows), vestibule (purple asterisks), semicircular canals (dark blue arrows), mastoid air cells (green asterisks), internal auditory canal (pink asterisk).



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



- **外耳道：**通常长 2.5 厘米，呈 S 形。外侧 1/3 由与外耳相延续的纤维软骨管构成。内侧 2/3 由骨环绕，源自颞骨的鼓部和鳞状部。
- **中耳，也称为鼓室：**是颞骨岩部内一个充满空气的腔室，借鼓膜与外耳分隔，借鼓室的内侧壁与内耳分隔。它包含听小骨。
- **内耳和内耳道：**内耳指骨迷路、膜迷路及其内容物。它分为三个部分，即耳蜗、前庭和半规管。

**图 24 A～C** 展示了外周听觉器官主要解剖结构的正常解剖形态。

**图 24**

**A～C.** 颞骨的轴位高分辨率 CT 切片。外耳道（白色星号）、鼓膜（白色箭头）、中耳（绿色星号）、颈内动脉（红色星号）、颈内静脉（蓝色星号）、锤骨（红色箭头）、砧骨（橙色箭头）、镫骨（黄色箭头）、耳蜗（粉红色箭头）、前庭（紫色星号）、半规管（深蓝色箭头）、乳突气房（绿色星号）、内耳道（粉红色星号）。

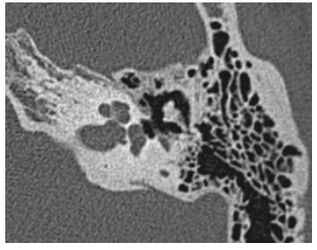


**FIGURE 25**

**High resolution CT:** depicts the anatomy of the bony labyrinth in exquisite detail.

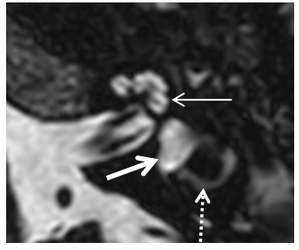


**FIGURE 26**

**High resolution MRI.** This is a dedicated nerve sequence demonstrating the inner ear. The high signal in the cochlea (arrow), vestibule (thick arrow) and lateral semicircular canal (dashed arrow) s is mainly due to the perilymph.

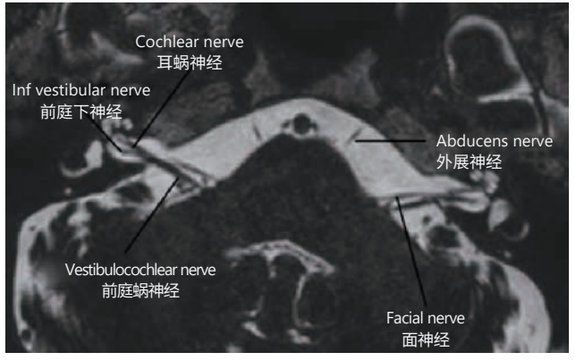



**FIGURE 27**

**The Internal auditory canal** contains the vestibulocochlear nerve which supplies the vestibulocochlear apparatus.

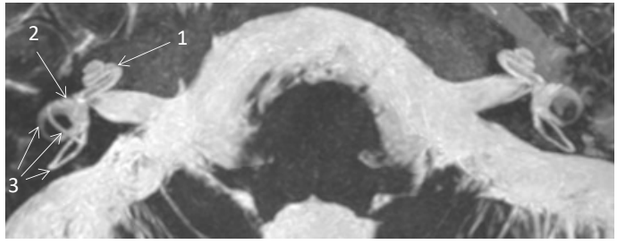



**FIGURE 28**

**Volume rendered axial T2 sequence** (Maximum Intensity Projection, MIP) clearly depicts of the vestibulocochlear apparatus, which is divided into three parts: cochlea (1), vestibule (2), semicircular canals (3).

**<!> ATTENTION**

**MRI** is the imaging technique of choice for the assessment of the inner as it depicts its anatomy in exquisite detail (Figs. 26-29).

**High resolution CT** is indicated for the assessment of the middle ear in the context of trauma or inflammatory conditions to look for any fluid in the tympanic cavity and mastoid air cells, and to assess the integrity of the ossicular chain and walls of the middle ear.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



**图 25**

高分辨率 CT：极其详细地显示骨迷路的解剖结构。

**图 26**

高分辨率 MRI。这是展示内耳的专用神经序列。耳蜗（箭头）、前庭（粗箭头）和外半规管（虚线箭头）的高信号主要由外淋巴所致。

**图 27**

内听道内有前庭蜗神经，为前庭蜗器提供神经支配。

**图 28**

容积再现轴位 T2 序列（最大密度投影，MIP）清晰显示前庭蜗器，其分为三个部分：耳蜗 (1)、前庭 (2)、半规管 (3)。

**<!> 注意**

**MRI** 是评估内耳的首选成像技术，因为它能够极其详细地显示内耳解剖结构（图26～29）。

**高分辨率 CT** 适用于评估创伤或炎症性疾病情况下的中耳，用于观察鼓室和乳突气房内是否有积液，以及评估听骨链和中耳壁的完整性。

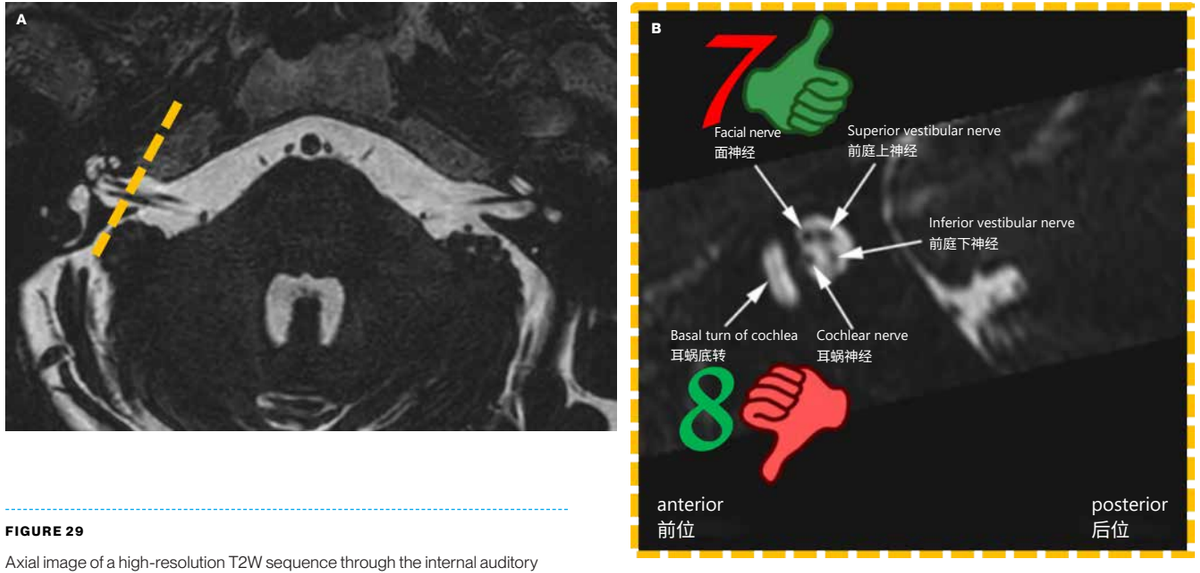



**FIGURE 29**

Axial image of a high-resolution T2W sequence through the internal auditory canal (**A**) with the corresponding sagittal oblique reformatted image (**B**) obtained at this level (plane marked by the dotted yellow line within the internal auditory meatus). The sagittal oblique reformatted image shows the normal position of the facial nerve, cochlear nerve, and superior and inferior vestibular nerves. Note that the facial nerve lies superiorly (thumbs up sign) and the cochlear nerve lies below it (thumbs down sign). The superior and inferior vestibular nerves lie posteriorly to the facial and cochlear nerves, respectively.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



**图 29**

内耳道高分辨率 T2W 序列的轴位图像 (A)，以及在该水平（内耳道内黄色虚线标记的平面）获得的相应矢状斜位重组图像 (B)。矢状斜位重组图像显示了面神经、耳蜗神经以及前庭上神经和前庭下神经的正常位置。注意，面神经位于上方（竖大拇指标志），耳蜗神经位于其下方（倒竖大拇指标志）。前庭上神经和前庭下神经分别位于面神经和耳蜗神经的后方。

# Anatomical Variants



## Head and Neck Imaging

## 头颈部影像学

**CHAPTER OUTLINE:**



**章节大纲：**



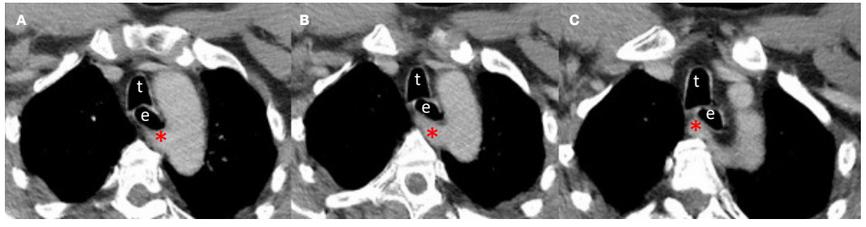


# 解剖结构变异

# / Vascular

**FIGURE 30**

Axial CT images (**A**)-(**C**) depict an arteria lusoria (asterisk). Trachea (t). Esophagus (e).




**Aberrant right subclavian artery (Fig. 30)** also known as arteria lusoria: is the commonest aortic arch anomaly with an estimated incidence of 0.5-2%. If there is a retro-oesophageal course, it can get compressed between the oesophagus and the vertebrae. Arteria lusoria is often asymptomatic but about 10% of people may complain of dysphagia.

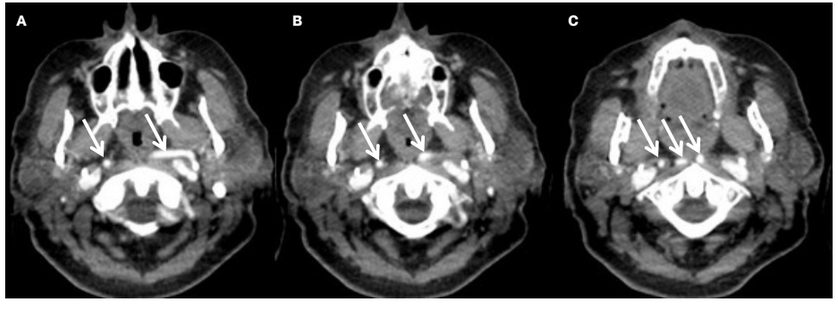



**FIGURE 31**

Axial contrast enhanced CT images (**A-C**) depict a **retropharyngeal course of the internal carotid arteries** (arrows), which almost come to lie next to each other in (c), sometimes referred to as "kissing carotids".

**Medialised course of the internal carotid artery (Fig. 31):** this case demonstrates bilateral tortuous medialised internal carotid arteries known as "kissing carotids". This must not be confused with a submucosal pharyngeal mass as biopsy here could result in life-threatening haemorrhage. This vascular anomaly also poses surgical risk during a tonsillectomy. Damage to the ICA during tonsillectomy was first described in the 1780s.

**<∞> REFERENCE**

https://radiopaedia.org/articles/aberrant-right-subclavian-artery
Wasserman JM, Sclafani SJ, Goldstein NA. Intraoperative evaluation of a pulsatile oropharyngeal mass during adenotonsillectomy. Int J Pediatr Otorhinolaryngol. 2006 Feb;70(2):371-5. doi: 10.1016/j.ijporl.2005.07.002. Epub 2005 Aug 19. PMID: 16112205



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

# / 血管性

**章节大纲：**



**异位右侧锁骨下动脉（图 30）**也称为迷走动脉：是最常见的主动脉弓异常，发病率约为 0.5%～2%。如果其走行于食管后方，可能会在食管和椎体之间受到压迫。迷走动脉通常无症状，但约 10% 的人可能会主诉吞咽困难。

**图 30**

轴位 CT 图像 (**A**)～(**C**) 显示迷走动脉（星号）。气管 (t)。食管 (e)。

**颈内动脉向内侧走行（图 31）：**本病例显示双侧迂曲的颈内动脉向内侧走行，称为“亲吻颈动脉”。切不可将其与黏膜下咽部肿物相混淆，因为活检可能会导致危及生命的出血。这种血管异常也会给扁桃体切除术带来手术风险。扁桃体切除术中颈内动脉 (ICA) 受损的情况最早见于 18 世纪 80 年代。

**图 31**

轴位增强 CT 图像 (**A**～**C**) 显示，颈内动脉走行于咽后（箭头），在 (c) 中几乎相互贴近，有时被称为“亲吻颈动脉”。

**<∞> 参考文献**

https://radiopaedia.org/articles/aberrant-right-subclavian-artery
Wasserman JM, Sclafani SJ, Goldstein NA. Intraoperative evaluation of a pulsatile oropharyngeal mass during adenotonsillectomy. Int J Pediatr Otorhinolaryngol. 2006 Feb;70(2):371-5. doi: 10.1016/j.ijporl.2005.07.002. Epub 2005 Aug 19. PMID: 16112205

# / Ectopic Thyroid

**Ectopic thyroid tissue (Fig. 32):** The thyroid gland normally migrates down from the foramen cecum at the posterior aspect of the tongue to its permanent location in the infrahyoid neck. Ectopic thyroid tissue refers to thyroid tissue found along this embryological course.

**<∞> REFERENCE**

> see also eBook chapter on Pediatric Radiology

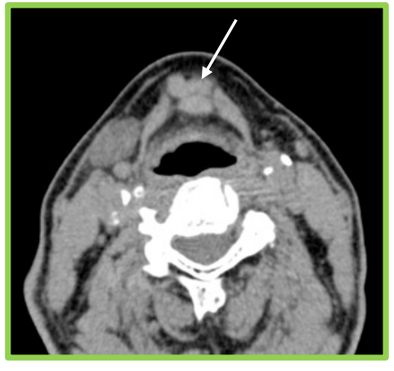




**FIGURE 32**

**Ectopic thyroid tissue** below the hyoid bone (imaging plane indicated with green line) protruding into the preepiglottic space (arrow) as seen on CT. Normal thyroid gland (imaging plane with blue line) in normal anatomic position (asterisks). Images courtesy of Lorenzo Ugga, MD (University of Naples Federico II, Naples, Italy).



/ **Head and Neck** Imaging

**CHAPTER OUTLINE:**







/ 头颈部影像学

**章节大纲：**



# / 异位甲状腺

**异位甲状腺组织（图 32）：**甲状腺通常从舌后部的盲孔向下迁移，最终定位于舌骨下的颈部区域。异位甲状腺组织指分布于胚胎迁移路径上的甲状腺组织。

**<∞> 参考文献**

> 另请参阅《儿科放射学》电子书章节

**图 32**

**异位甲状腺组织**（成像平面用绿线标示），突入会厌前间隙（箭头），如 CT 所示。正常位置的甲状腺（成像平面用蓝线标示），位于正常解剖位置（星号）。图像由 Lorenzo Ugga 医学博士（意大利那不勒斯，那不勒斯费德里科二世大学 [University of Naples Federico II]）提供。

# / Paranasal Sinuses

**Onodi cell** also known as sphenoethmoidal cell, is a posterior ethmoidal cell. This is pneumatised far laterally and superiorly to the sphenoid cell. Optic nerve and carotid artery often found lateral to the Onodi (instead of sphenoid)

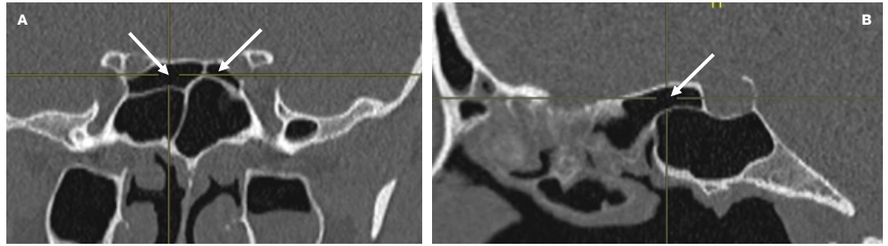



**FIGURE 33**

Bilateral Onodi cells (arrows) as seen on (**A**) coronal and (**B**) sagittal CT images.

**Nasal septal spurs** can be associated with nasal septal deviation. In this case the spur is arising from the left side of the nasal septum and is displacing the middle turbinate superiorly.

**FIGURE 34**

Nasal septal spur (arrow) as seen on a coronal CT image.





**CHAPTER OUTLINE:**









章节大纲：



# / 鼻旁窦

**奥诺迪气房**也称为蝶筛细胞，是后组筛窦气房。它向蝶窦气房的外侧和上方过度气化。视神经和颈动脉常位于奥诺迪气房（而非蝶窦）的外侧

**鼻中隔骨棘**可与鼻中隔偏曲有关。本例中，骨棘起自鼻中隔左侧，将中鼻甲向上推移。

**图 33**

(A) 冠状位和 (B) 矢状位 CT 图像上显示的双侧奥诺迪气房（箭头）。

**图 34**

冠状位 CT 图像上显示的鼻中隔骨棘（箭头）。

# Diagnostic Imaging Techniques



## Head and Neck Imaging

**CHAPTER OUTLINE:**





## 头颈部影像学

**章节大纲：**



# 影像诊断技术

# / Conventional X-Ray

Applications of conventional radiography in head and neck imaging:

- / Emergency setting – retropharyngeal or prevertebral space abscess, suspected acute supraglottitis (**Fig. 35**)
- / Paranasal sinuses/facial bones in the context of trauma
- / Dental pathology
- / Bony pathology of the maxilla and mandible, e.g., osteonecrosis (**Fig. 36**), cherubism, fibrous dysplasia.
- / Conventional sialography (rarely used as mainly replaced by MR sialography)
- / Salivary glands to identify calculi (now largely superseded by CT or CBCT)

**>|< COMPARE**

**ADVANTAGES:**

+ Is a cheap, simple and quick imaging modality
+ Useful to diagnose calcified sialoliths or Ca2+ within the gland
+ Can identify adjacent osseous lesions
+ Superior spatial resolution

**DISADVANTAGES:**

– Radiation penalty
– Cannot identify soft tissue masses
– One-fifth of salivary ductal calculi are radiolucent (Rastogi R et al 2012)

**FIGURE 35**

Lateral conventional X-ray of the neck obtained in the emergency setting showing narrowing of the supraglottic larynx (arrow) due to acute supraglottitis.


**FIGURE 36**

Orthopantomography (OPT) showing an irregular mandibular bony structure with areas of sclerosis and lysis due to osteoradionecrosis (asterisks) in a patient with previous radiotherapy for a head and neck cancer.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







# / 常规 X 线

## / 头颈部影像学

**章节大纲：**



常规 X 线摄影在头颈部影像学中的应用：

- / 急诊场景 - 咽后或椎前间隙脓肿、疑似急性声门上炎（图 35）
- / 创伤情况下的鼻旁窦/面骨检查
- / 牙科病变
- / 上颌骨和下颌骨病变，如骨坏死（图 36）、巨颌症、纤维性发育不良。
- / 常规涎管造影（很少使用，因主要已被 MR 涎管造影取代）
- / 识别涎腺结石（现已在很大程度上被 CT 或 CBCT 取代）

**>|< 比较**

**优点：**

+ 是一种便宜、简单且快速的影像学检查方法
+ 有助于诊断钙化的涎石或腺体内部的钙盐沉积
+ 可识别相邻的骨病变
+ 空间分辨率更高

**缺点：**

– 辐射风险说明
– 无法识别软组织肿块
– 约五分之一的涎管结石在 X 射线下不显影 (Rastogi R et al 2012)

**图 35**

颈部侧位常规 X 线，急诊场景下拍摄，显示因急性声门上喉炎导致声门上喉腔狭窄（箭头）。

**图 36**

口腔全景摄影 (OPT) 显示，一名既往因头颈癌接受过放射疗法患者的下颌骨骨质结构不规则，存在硬化区和溶解区，符合放射性骨坏死表现（星号）。

## Paranasal sinuses/facial bones X-ray:

On plain radiographs the normal sinuses are transradiant because they contain air. Plain films can show mucosal thickening, fluid levels, bone destruction and fractures. High resolution CT is however the preferred imaging modality for the assessment of sinus disease due to its multiplanar capability, high sensitivity and high specificity.

X-ray projections that are normally used include:

**Waters view (Fig. 37):** best to assess the maxillary and frontal sinuses, the floor of the orbit, orbital rim and infraorbital foramen.

**Lateral view (Fig. 38):** best for assessment of the sphenoid sinus, sella turcica. The frontal, ethmoid, and maxillary sinuses are superimposed on each other. Other structures that can be visualised include clivus, nasopharynx, hard palate, soft palate and mandible.

**Sialography (Fig. 39)** uses a digital subtraction method and relies on retrograde intra-ductal injection of a water-soluble, iodinated, contrast medium into Stenson's/Wharton's duct opening.


**FIGURE 37**

Waters view

**FIGURE 38**

Waters view

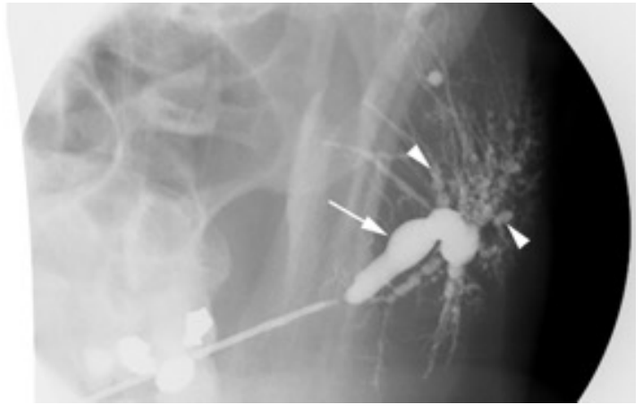


**FIGURE 39**

Conventional sialography showing dilatation of the left Stensen's duct (arrow) associated with globular dilatation of the intraparenchymal ducts (arrowheads) consistent with advanced sialectasis.



**Head and Neck Imaging**

**CHAPTER OUTLINE:**







**头颈部影像学**

**章节大纲：**



## 鼻旁窦/面骨 X 线检查：

在平片上，正常鼻窦因含气而可透 X 射线。平片可显示黏膜增厚、液平面、骨破坏及骨折情况。不过，高分辨率 CT 凭借其多平面成像能力、高敏感性和高特异性，是评估鼻窦疾病时更优选的影像学检查方法。

通常采用的 X 线投影位置包括：

华氏位（图 37）：最适合评估上颌窦、额窦、眶底、眶缘和眶下孔。

侧位（图 38）：最适合评估蝶窦、蝶鞍。额窦、筛窦和上颌窦会相互重叠。还可显示的其他结构包括斜坡、鼻咽、硬腭、软腭和下颌骨。

涎管造影（图 39）采用数字减影法，需经导管逆行注入水溶性含碘造影剂至斯滕森管（腮腺导管）/沃顿管（下颌下腺导管）开口处。

**图 37**

华氏位

**图 38**

华氏位

**图 39**

常规涎管造影显示左侧施滕森管扩张（箭头），伴实质内导管球状扩张（箭头），符合晚期涎管扩张表现。

# / CT

## Indications

Non-contrast high-resolution CT or CBCT:

1. **Paranasal sinuses:** prior to functional endoscopic sinus surgery (FESS). It provides information about the pathology itself and also highlights important anatomical variants/landmarks which the surgeons needs to know in order to avoid post-operative complications.

2. **Temporal bones:** Inflammatory conditions such as otits media and cholesteatoma. It identifies the pathology and assesses the severity in terms of ossicular erosion/destruction. In the context of trauma, it detects temporal bone fractures, ossicular dislocations, involvement of the otic capsule.

3. **Sialolithiasis:** Non-contrast CT is highly specific in detecting calcified calculi however it is not indicated in the assessment of salivary gland duct system.

4. **Any pathology of the bony structures,** e.g.,, fibrous dysplasia (Fig. 40), osteoradionecrosis (Fig. 41), fractures, etc.

>-< FURTHER KNOWLEDGE

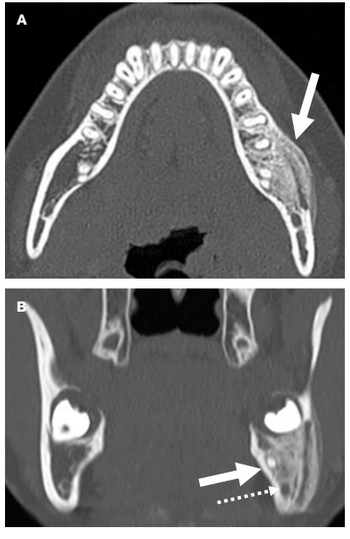



**FIGURE 40**

Axial (A) and coronal (B) images from a high-resolution CT demonstrating the presence of fibrous dysplasia involving the left hemimandible (arrow) and clearly delineating its relationship to the inferior alveolar nerve (dashed arrow).

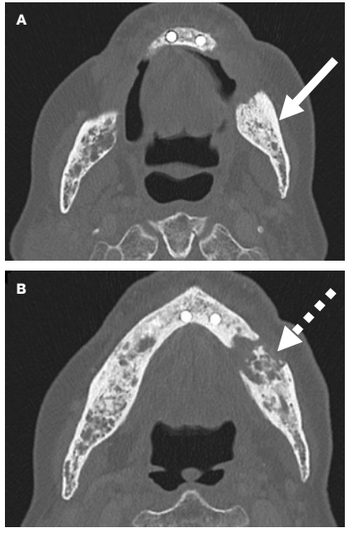



**FIGURE 41**

Axial images from a non-contrast high resolution CT demonstrating osteonecrosis of the left mandible (arrow) in (A) with massive bone destruction and sequestrum formation (dashed arrow) in (B) as a complication of radiotherapy for oral cavity SCC.



/ **Head** and **Neck** Imaging

**CHAPTER OUTLINE:**







/ 头颈部影像学

**章节大纲：**



# / CT

## 适应证

平扫高分辨率 CT 或 CBCT：

1. **鼻旁窦：**功能性内窥镜鼻窦手术 (FESS) 术前检查。可提供病变本身的信息，还能凸显重要的解剖结构变异/标志，这些是外科医生为避免术后并发症需要了解的内容。

2. **颞骨：**中耳炎、胆脂瘤等炎性疾病。可识别病变，评估听小骨侵蚀/破坏的严重程度。创伤时，可检测颞骨骨折、听小骨脱位及骨迷路受累情况。

3. **涎石病：**平扫 CT 对检测钙化的涎石特异性高，但不适用于评估涎腺导管系统。

4. **骨性结构病变，**如纤维性发育不良（图 40）、放射性骨坏死（图 41）、骨折等病变。

>-< 进阶知识

**图 40**

高分辨率 CT 轴位 (A) 和冠状位 (B) 图像，显示累及左侧下颌骨半侧的纤维性发育不良（箭头），清晰显示其与下牙槽神经（虚线箭头）的关系。

**图 41**

平扫高分辨率 CT 轴位图像，显示左侧下颌骨放射性骨坏死（A 图箭头），伴大量骨破坏及死骨形成（B 图虚线箭头），为口腔鳞状细胞癌 (SCC) 放射疗法后的并发症。

Post-contrast CT scan:

1. **Acute neck space infections** for instance acute epiglottitis, tonsillar abscess, peritonsillar abscess, Ludwig's angina, masticator space abscess after dental extraction, deep neck space infection complicating malignant otitis externa, complicated otomastoiditis, etc.
2. **Post-trauma:** Carotid or vertebral artery dissection, laryngeal trauma.
3. **Staging of head and neck malignancies** particularly when MRI is contraindicated.
4. **Osteonecrosis of the mandible or maxilla:** following radiotherapy or bisphosphonate therapy. To rule out associated abscesses or disease recurrence in the context of known malignancy.

## >|< COMPARE

**ADVANTAGES:**

+ Quick and better tolerated by patients. This is particularly useful in trauma and in patients with extensive neck malignances (especially oropharyngeal and laryngeal) who are unable to spend prolonged periods of time in the supine position.
+ Multiplanar and volume rendering capability (especially useful to the surgeons when dealing with complex facial/LeFort fractures for surgical planning).
+ Demonstrates the osseous lesions/extension and calcification/calculus better than MRI.

**DISADVANTAGES:**

– Uses ionising radiation with its inherent risks.
– Limited soft tissue contrast resolution when compared to MRI limiting its value for locoregional staging of certain head and neck malignancies such as nasopharyngeal, oral cavity and oropharyngeal cancer.
– Certain artefacts from dental restoration may obliterate the region of interest, significantly limiting its diagnostic accuracy.



# Head and Neck Imaging

**CHAPTER OUTLINE:**







# 头颈部影像学

**章节大纲：**



增强后 CT 扫描：

1. **急性颈部间隙感染**，如急性会厌炎、扁桃体脓肿、扁桃体周围脓肿、路德维氏咽峡炎、拔牙后咀嚼肌间隙脓肿、恶性外耳道炎并发的深部颈部间隙感染、复杂性中耳乳突炎等。
2. **创伤后：**颈动脉或椎动脉夹层、喉部创伤。
3. **头颈部恶性肿瘤分期**，尤其在 MRI 禁忌时适用。
4. **下颌骨或上颌骨骨坏死：**放射疗法或双膦酸盐治疗后。用于排除已知恶性肿瘤情况下伴发脓肿或疾病复发。

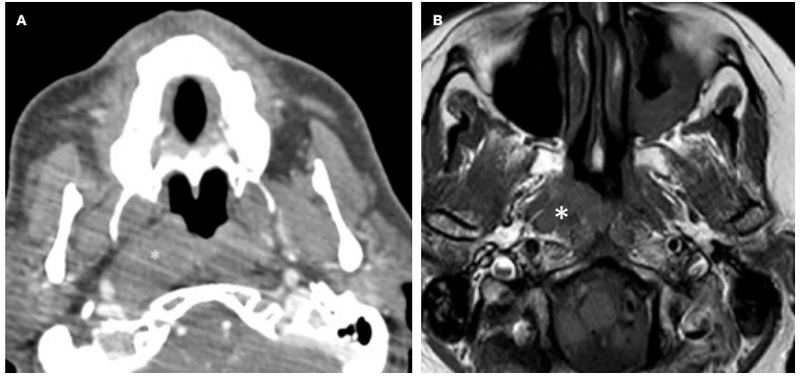
## >|< 比较

**优点：**

+ 检查速度快，患者耐受性更好。这在创伤患者以及广泛颈部恶性肿瘤（尤其是口咽和喉癌）患者中尤为实用，因为此类患者无法长时间保持仰卧位。
+ 具备多平面和容积重建功能（处理复杂面部/LeFort 骨折以制定手术方案时，对外科医生特别有用）。
+ 相较于 MRI，能更好地显示骨性病变/侵犯范围以及钙化灶/结石。

**缺点：**

– 采用电离辐射，存在固有风险。
– 与 MRI 相比，软组织对比分辨率有限，限制了其对头颈部某些恶性肿瘤（如鼻咽癌、口腔癌和口咽癌）进行局部区域分期的价值。
– 牙科修复体产生的某些伪影可能会掩盖感兴趣区域，显著降低其诊断准确性。




>|< COMPARE

**FIGURE 42**

Same patient, different imaging modality. **A.** CT is fast, well tolerated, and readily available but has lower contrast resolution and requires iodinated contrast material. Asterisks indicate nasopharyngeal cancer. **B.** Note improved lesion conspicuity on the MR image.

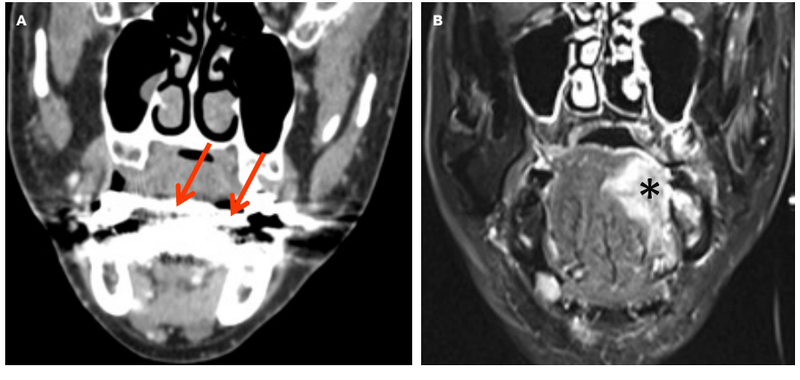



**FIGURE 43**

Patient with a left-sided oral tongue cancer, which was obscured by the artefacts arising from dental fillings on CT in **A.** (arrows) but was then picked up on MRI (asterisk) in **B.** MRI is less affected by dental fillings than CT.

<!> ATTENTION

MRI has a higher contrast resolution than CT (Fig. 42).

MRI is less affected by dental artifacts than CT (Fig. 43).



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



>|< 比较

**图 42**

同一患者，不同影像学检查方法。**A.** CT 检查速度快、患者耐受性好且易于开展，但对比分辨率较低，且需要含碘造影剂。星号所示为鼻咽癌。**B.** 注意在 MR 图像上，病变显示更清晰。

**图 43**

左侧口腔舌癌患者，在 A 图的 CT 图像中，病变因牙科填充物产生的伪影而显示不清（箭头），但在 B 图的 MRI 中被检出（星号）。与 CT 相比，MRI 受牙科填充物伪影的影响更小。

<!> 注意

MRI 的对比分辨率高于 CT（图 42）。

与 CT 相比，MRI 受牙科填充物伪影的影响更小（图 43）。

# / CBCT

## Indications

(Some are identifical to those of high-resolution non-contrast CT)

**Paranasal sinuses:** prior to functional endoscopic sinus surgery. It provides information about the pathology itself and also highlights important anatomical variants/landmarks which the surgery needs to know in order to avoid post-operative complications.

**Temporal bones:** Inflammatory conditions such as otomastoiditis, otits media and cholesteatoma. It identifies the pathology and assesses the severity in terms of ossicular erosion/destruction.

**Dental imaging:** Extensively used prior to dental implantation or dental extraction to help localise the inferior alveolar nerve. Also helps for volume measurement of odontogenic lesions pre- and post-operatively.

**>|< COMPARE**

**ADVANTAGES:**

+ Quick and well-tolerated by patients.
+ Higher spatial resolution compared to conventional multidetector CT.
+ Lower radiation dose compared to conventional CT.
+ Multiplanar and volume rendering capability.

**DISADVANTAGES:**

– Uses ionising radiation.
– Unable to assess the soft tissues, only bones.



**CHAPTER OUTLINE:**







# / 锥形束计算机断层扫描

**章节大纲：**



## 适应证

（部分与高分辨率平扫 CT 的适应证相同）

**鼻旁窦：**功能性内窥镜鼻窦手术 (FESS) 术前检查。可提供病变本身的信息，还能凸显重要的解剖结构变异/标志，这些是手术中为避免术后并发症需要了解的内容。

**颞骨：**中耳乳突炎、中耳炎、胆脂瘤等炎性疾病，可识别病变，评估听小骨侵蚀/破坏的严重程度。

**牙科成像：**广泛用于牙种植或拔牙术前，辅助定位下牙槽神经。也有助于术前和术后对牙源性病变进行体积测量。

**>|< 比较**

**优点：**

+ 检查速度快，患者耐受性好。
+ 与常规多排探测器 CT 相比，空间分辨率更高。
+ 与常规 CT 相比，辐射剂量更低。
+ 具备多平面和容积重建功能。

**缺点：**

– 采用电离辐射。
– 无法评估软组织，仅能显示骨骼情况。

# / MRI

## Indications

Pre- and post-contrast MRI:

1. **Locoregional staging of head and neck malignancy:** Certain parts of the head and neck are much better delineated with MRI such as the nasopharynx, oropharynx and oral cavity. MRI has the capability of demonstrated the presence of local invasion of the nerves (perineural spread) which is critical for staging. Intracranial extension is also clearly depicted on MRI.
2. **Pediatric head and neck emergencies:** For instance, subperiosteal abscesses complicating acute sinusitis to delineate any intraorbital extension, cavernous sinus thrombosis or subdural abscess formation.
3. **Detection of tumour recurrence after treatment:** MRI is superior to CECT.

Non-contrast MRI

1. Cholesteatoma imaging: essential in detecting chlesteatoma recurrence after surgery.
2. MR Sialography: used to study the ductal system precluding the need for direct contrast injection into the duct.

### >|< COMPARE

**ADVANTAGES:**

+ No ionising radiation.
+ Multiplanar and volume rendering capability (especially useful to the surgeons for surgical planning.
+ Superior soft tissue contrast resolution allowing better characterisation of the lesion based on its signal characteristics and enhancement pattern.
+ Certain artefacts from dental restoration may obliterate the region of interest limiting the diagnostic MRI accuracy, however, in most cases MRI allows superior lesion delineation in comparison to CT (**Fig. 43** from page 38).
+ MR sialography can be performed in patients with acute sialadenitis, which is a contraindication to X-ray sialography (page 35).

**DISADVANTAGES:**

– Standard contraindications to MRI (claustrophobia, certain types of pace-makers, neurostimulators, ferromagnetic foreign bodies).
– Longer exam when compared to US and CT.
– More susceptible to motion artefacts (swallowing, breathing and pulsation artefacts).
– Patients with extensive neck malignances (especially oropharyngeal and laryngeal) or tracheostomies are unable to spend prolonged periods of time in the supine position.





**CHAPTER OUTLINE:**









**章节大纲：**



# / MRI

## 适应证

平扫及增强后 MRI：

1. **头颈部恶性肿瘤的局部区域分期：**头颈部的某些部位，如鼻咽、口咽和口腔，用 MRI 显示得更清晰。MRI 可显示神经受局部侵犯（神经周围扩散）的情况，这对分期至关重要。颅内侵犯范围在 MRI 上也能清晰显示。
2. **儿童头颈部急诊：**例如，急性鼻窦炎并发的骨膜下脓肿，用于显示有无眶内侵犯、海绵窦血栓形成或硬脑膜下脓肿形成。
3. **治疗后肿瘤复发的检测：**MRI 优于 CECT。

平扫 MRI

1. 胆脂瘤成像：对术后胆脂瘤复发的检测至关重要。
2. MR 涎管造影：用于研究导管系统，无需向导管内直接注入造影剂。

### >|< 比较

**优点：**

+ 无电离辐射。
+ 具备多平面和容积重建功能（对外科医生制定手术方案特别有用）。
+ 软组织对比分辨率更优，可依据病变的信号特征和强化模式，更好地对病变进行定性。
+ 虽然牙科修复体产生的某些伪影可能会掩盖感兴趣区域，限制 MRI 的诊断准确性，但在大多数情况下，与 CT 相比，MRI 对病变的显示更清晰（见第 38 页图 **43**）。
+ 对于急性涎腺炎患者，可进行 MR 涎管造影检查，而急性涎腺炎是涎管 X 线造影的禁忌证（见第 35 页）。

**缺点：**

– 存在 MRI 的标准禁忌证（幽闭恐怖症、某些类型的起搏器、神经刺激器、铁磁性异物）。
– 与 US 和 CT 相比，检查时间更长。
– 对运动伪影更敏感（吞咽、呼吸及搏动伪影）。
– 广泛颈部恶性肿瘤（尤其是口咽和喉癌）患者，或行气管切开术的患者，无法长时间保持仰卧位。

# / Ultrasound

## Indications

- / Assesment and classification of thyroid lesions.
- / Suspected salivary gland tumours.
- / Sialolithiasis.
- / Acute sialadenitis.
- / Helps distinguish solid from cystic lesions in the neck.
- / High specificity and sensitivity for pathological lymph nodes (**Figs. 44, 45**). Can distinguish between benign and malignant lymph nodes based on their shape, size and pattern of vascularit.

**>|< COMPARE**

**ADVANTAGES:**

+ Quick and cheap.
+ Noninvasive.
+ No ionising radiation.
+ Helps in diagnosing sialolithiasis.
+ Differentiates cystic from solid lesions.
+ Aids in guiding the exact site of FNA or biopsy in suspected salivary gland lesions or lymph node metastases.
+ In experienced hands, it helps differentiate intra-parotid nodes from true intraparenchymal lesions.
+ Excellent spatial resolution.

**DISADVANTAGES:**

– Operator dependent.
– No standardized, reproducible imaging documentation.
– Unable to assess retrosternal, retropharyngeal, skull base or any other deep-seated lesions.
– Cannot evaluate the deep lobe of the parotid gland.

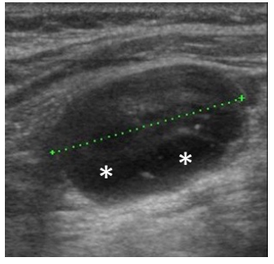


**FIGURE 44**

Targeted US image demonstrating a morphologically abnormal lymph node which has cystic portions (asterisks) and has no central fatty hilum. FNA was performed and confirmed the presence of metastatic non-keratinizing SCC from a nasopharyngeal primary.

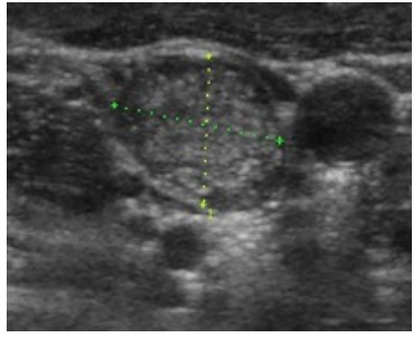


**FIGURE 45**

US shows a pathological lymph node. It is round, with no fatty hilum and contains several microcalcifications (small hyperechoic areas). Findings are pathognomonic of metastatic papillary carcinoma.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 超声

## 适应证

- / 甲状腺病变的评估与分类。
- / 可疑涎腺肿瘤。
- / 涎石病。
- / 急性涎腺炎。
- / 有助于区分颈部的实性病变与囊性病变。
- / 对病理性淋巴结的检测具有高特异性和高敏感性（图 44、45）。可根据淋巴结的形状、大小和血供模式，区分良性与恶性淋巴结。

**>|< 比较**

**优点：**

+ 快速、便宜。
+ 无创。
+ 无电离辐射。
+ 有助于诊断涎石病。
+ 区分囊性病变和实性病变。
+ 有助于在可疑涎腺病变或淋巴结转移时，引导细针穿刺抽吸或活检的精准定位。
+ 经验丰富的医生可借助其区分腮腺内淋巴结与真正的腮腺实质病变。
+ 空间分辨率极佳。

**缺点：**

– 依赖操作者。
– 缺乏标准化、可重复的影像学采集和记录体系。
– 无法评估胸骨后、咽后、颅底或其他深部病变。
– 无法评估腮腺深叶。

**图 44**

靶向 US 图像显示一个形态异常的淋巴结，该淋巴结有囊性部分（星号），无中央脂肪门。经细针穿刺抽吸活检证实，此为鼻咽癌原发的转移性非角化性 SCC。

**图 45**

US 显示一个病理性淋巴结。该淋巴结呈圆形，无脂肪门，且含多个微钙化（小的高回声区）。这些表现是转移性乳头状癌的特征性表现。

# / PET CT

## Indications

- / Staging of malignancies affecting the head and neck, e.g., , head and neck squamous cell carcinoma, lymphoma (**Fig. 46**), melanoma, some forms of thyroid cancer.
- / Baseline imaging before commencement of treatment.
- / Assessing response to therapy.
- / Evaluation of disease recurrence.
- / As a problem-solving tool in cases of tumour of unknown origin.
- / Suspected malignant transformation in plexiform neurofibromata (NF type 1).

**>|< COMPARE**

**ADVANTAGES:**

+ Enables acquisition of both functional and anatomical information in a single study
+ May have diagnostic value detecting metastatic lesions which might be missed with conventional imaging
+ Can assess locoregional lymph node spread more precisely than CT

**DISADVANTAGES:**

– Ionising radiation
– Long acquisition times
– Limited spatial resolution

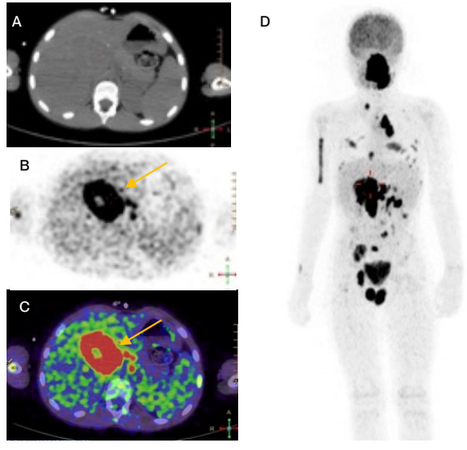



**FIGURE 46**

Extensive nodal, skeletal, liver, and testicular metastatic disease with possible lung involvement in a pediatric patient with non-Hodgkin's lymphoma of the mandible and maxilla. a. Axial CT image through the liver. b Corresponding PET image showing a large hypermetabolic lesion (arrow.). c. PET CT fused image. Arrow points at liver metastasis. d. 3D PET whole body projection showing multiple FDG avid lesions.

**<∞> REFERENCE**

Lecchi M, Fossati P, Elisei F, Orecchia R, Lucignani G. Current concepts on imaging in radiotherapy. Eur J Nucl Med Mol Imaging. 2008 Apr;35(4):821-37. doi: 10.1007/s00259-007-0631-y. Epub 2007 Oct 31. PMID: 17972074.
Clinical indications for positron emission tomography. Oxford University Hospitals. 2003. National Health Service, UK



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







# / PET-CT

## 适应证

- / 头颈部恶性肿瘤的分期，如头颈部 SCC、淋巴瘤（图 46）、黑色素瘤、某些类型的甲状腺癌。
- / 治疗开始前的基线成像。
- / 评估治疗反应。
- / 评价疾病复发情况。
- / 作为原发灶不明肿瘤的诊疗辅助工具。
- / 可疑丛状神经纤维瘤（1 型神经纤维瘤）发生恶性转化时的检查。

**>|< 比较**

**优点：**

+ 可在单次检查中同时获取功能和解剖信息
+ 对于常规成像可能漏检的转移灶，可能具有诊断价值
+ 相较于 CT，能更精准地评估局部区域淋巴结转移情况

**缺点：**

– 电离辐射
– 采集时间长
– 空间分辨率有限

**图 46**

一名患有下颌骨和上颌骨非霍奇金淋巴瘤的儿科患者，存在广泛的淋巴结、骨骼、肝脏和睾丸转移病灶，肺部可能也受累。a. 肝脏的轴位 CT 图像（箭头）。b. 对应的 PET-CT 图像，显示一个大的高代谢病灶（箭头）。c. PET-CT 融合图像，箭头指向肝转移灶。d. 3D PET 全身投影，显示多个 FDG 高摄取病灶。

**<∞> 参考文献**

Lecchi M, Fossati P, Elisei F, Orecchia R, Lucignani G. Current concepts on imaging in radiotherapy. Eur J Nucl Med Mol Imaging. 2008 Apr;35(4):821-37. doi: 10.1007/s00259-007-0631-y. Epub 2007 Oct 31. PMID: 17972074.
Clinical indications for positron emission tomography. Oxford University Hospitals. 2003. National Health Service, UK

## / 头颈部影像学

**章节大纲：**

# Inflammatory and Infectious lesions



## Head and Neck Imaging

## 头颈部影像学

**CHAPTER OUTLINE:**



**章节大纲：**





# 炎症性和感染性病变

# / Sinusitis & Complications

In inflammatory conditions of the paranasal sinuses, the imaging modality employed depends on the clinical situation.

As plain radiography is non-sensitive and non-specific, it has been largely replaced by CT (higher definition, superior detail and multiplanar capability).

**General rules:**

**Chronic sinusitis and nasal polyposis:**
Non-contrast multidetector low dose CT or cone beam CT (CBCT)

**Prior to FESS (functional endoscopic sinus surgery):**
Non-contrast low dose CT/CBCT (**Fig. 47**)

**Evaluation of congenital anomalies (cherubism, fibrous dysplasia)**
Non-contrast CT/CBCT

**Acute sinusitis with suspected orbital or intracranial complications:**
Contrast enhanced CT (emergency situation). If CT diagnosis is not clear, further evaluation with MRI is required to rule out intraorbital extension, subdural/ epidural abscess formation and cavernous sinus thrombosis .

**Should CT or CBCT be used?**

- CT: Can be used with or without iv. contrast. Allows assessment of soft tissues especially in the emergency setting
- CBCT: Useful pre-FESS to highlight important anatomical landmarks and variants. Allows assessment of dental pathology. Not suitable for assessment of the soft tissues

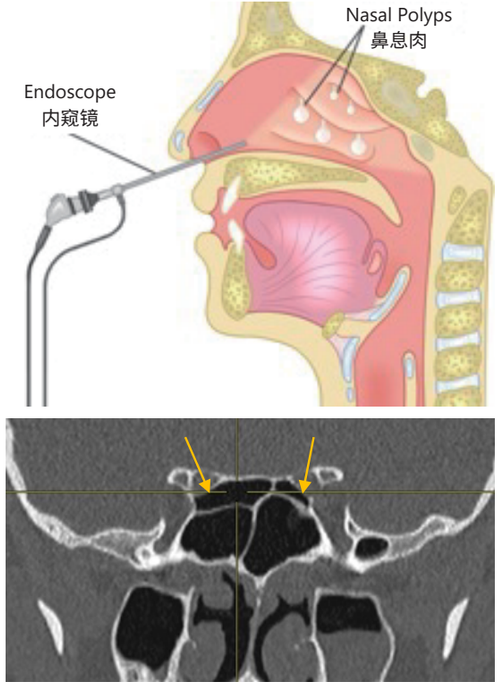



**FIGURE 47**

Coronal reconstructed image from a high-resolution CT. Bilateral Onodi cells (arrows). This puts the optic nerves at risk of damage during FESS and can only be identified at pre-operative imaging with CT or CBCT.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 鼻窦炎及其并发症

在鼻旁窦炎性疾病中，所采用的影像学检查方法取决于临床情况。

由于平片敏感性和特异性均较低，已在很大程度上被 CT 取代（CT 分辨率更高、细节更清晰，且具备多平面成像能力）。

**一般原则：**

**慢性鼻窦炎和鼻息肉病：**
平扫多排探测器低剂量 CT 或 CBCT

**功能性内窥镜鼻窦手术 (FESS) 术前检查：**
平扫低剂量 CT/CBCT（**图 47**）

**先天性异常（天使面容综合征、纤维性发育不良）的评估**
平扫 CT/CBCT

**急性鼻窦炎伴疑似眶内/颅内并发症：**
增强 CT（急诊情况）。若 CT 诊断不明确，需进一步行 MRI 检查，以排除眶内侵犯、硬膜下/硬膜外脓肿形成及海绵窦血栓形成。

**应选择 CT 还是 CBCT?**

- CT：可在使用或不使用静脉造影剂的情况下进行检查。有助于评估软组织，在急诊情况下尤为实用。
- CBCT： 在功能性内窥镜鼻窦手术 (FESS) 术前检查中有助于显示重要的解剖标志和变异情况。可评估牙科病变。但不适用于软组织评估。

**图 47**

高分辨率 CT 冠状位重组图像。显示双侧奥诺迪气房（箭头）。这种情况会使视神经在功能性内窥镜鼻窦手术 (FESS) 中面临损伤风险，且仅能通过术前 CT 或 CBCT 检查识别。

In the emergency setting, if there is suspicion of acute sinusitis with potential intraorbital or intracranial complications (**Figs. 48 and 49**), one must first start by requesting a contrast enhanced CT of the brain and sinuses.

CT with contrast allows precise abscess localisation and volume measurements, which aid surgical decision making.

MRI is used to search for cavernous sinus thrombosis or any other intracranial complications especially in cases with unclear CT features. In addition, MRI is superior to CT for distinguishing between cellulitis and abscess, a distinction which has therapeutic implications.


**FIGURE 48**

8-year-old boy presenting with severe left orbital cellulitis associated with diplopia. Contrast enhanced CT reconstructed in the coronal (a) and sagittal planes (b) confirms the presence of a subperiosteal abscess in the floor of the right orbit (yellow arrow). This was a complication of ipsilateral ethmoid and maxillary sinusitis.

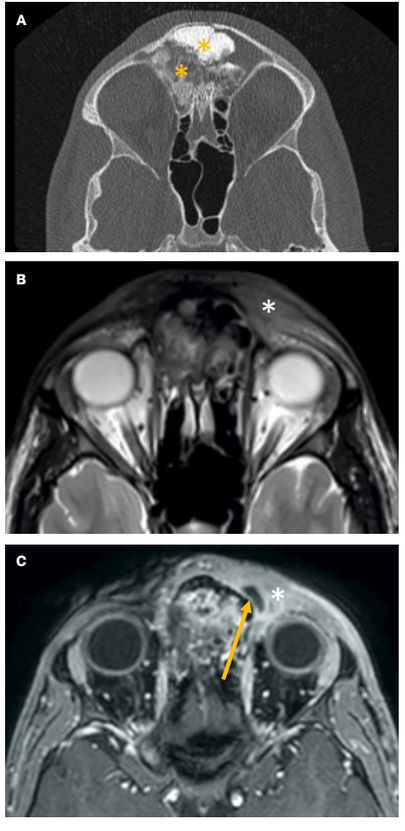



**FIGURE 49**

18-year-old patient presenting with pre-septal cellulitis secondary to a large sinonasal osteoma (yellow asterisks) in (a), showing a characteristic "Aunt Minnie" appearance on CT (a) with "popcorn" calcifications.

Further evaluation with MRI was performed. (b) Axial T2W sequence confirms the presence of extensive pre-septal cellulitis (white asterisks in b and c). (c) Axial fat suppressed T1 post-contrast confirms small abscess formation in the medial pre-septal soft tissues (arrow).



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



在急诊环境下，若怀疑急性鼻窦炎伴发潜在眶内或颅内并发症（**图 48 和 49**），首先必须申请脑部和鼻窦的增强 CT 检查。

增强 CT 能够精准定位脓肿并测量其体积，有助于制定手术决策。

当 CT 表现不明确时，可采用 MRI 排查海绵窦血栓形成或其他颅内并发症。此外，在区分蜂窝织炎和脓肿方面，MRI 优于 CT，而这种区分对治疗方案的选择有重要意义。

**图 48**

8 岁男孩，因严重左眼眶蜂窝织炎伴复视就诊。经冠状位 (a) 和矢状位 (b) 重组增强 CT，证实右眼眶底存在骨膜下脓肿（黄色箭头），这是同侧筛窦炎和上颌窦炎的并发症。

**图 49**

18 岁患者，因继发于大鼻窦骨瘤（黄色星号，图 a）的眶隔前蜂窝织炎就诊，CT（图 a）上可见特征性“Aunt Minnie”表现，伴“爆米花状”钙化。

进一步行 MRI 评估：(b) 轴位 T2W 序列证实存在广泛的眶隔前蜂窝织炎（图 b 和 c 中的白色星号）。(C) 轴位脂肪抑制 T1 增强后证实眶隔前内侧软组织内有小脓肿形成（箭头）。

## Acute Invasive Fungal Rhinosinusitis

In an immunocompromised patient (elderly diabetic or receiving chemotherapy), acute sinusitis is a medical emergency. Mucormycosis may rapidly progress to dry gangrene (Fig. 50).

Contrast enhanced CT (CECT) with soft tissue & bone windows allows to evaluate soft tissue infiltration & bone erosion in the emergency situation..

However, MRI is superior for evaluating intraorbital & intracranial extension of mucormycosis, defining the extent of affected areas. Affected areas present as nonenhancing lesions at MRI.

**<!> ATTENTION**

**Admission and urgent MRI is a must. CT may only show the tip of the iceberg!**

**>-< FURTHER KNOWLEDGE**

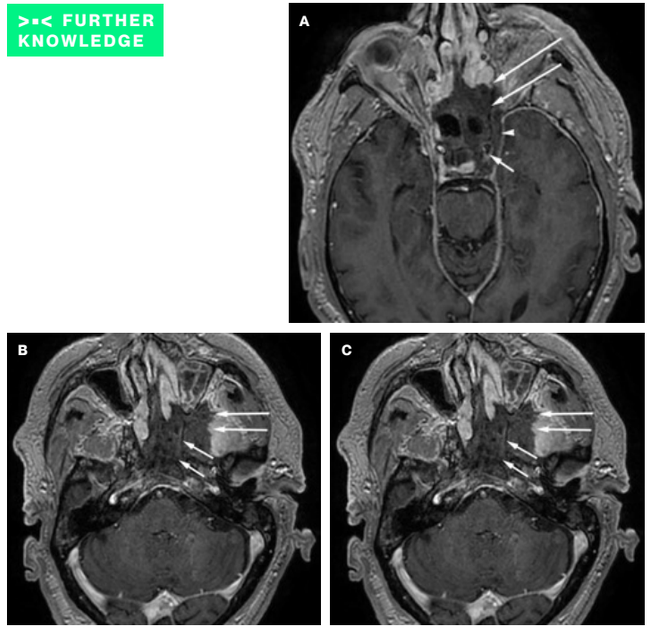



**FIGURE 50**

64 y/o male with h/o acute leukemia presents with severe frontal headache and facial paresthesia post-tooth extraction. Acute invasive fungal rhinosinusitis: rapidly progressive (hours to days) transmucosal fungal sinus infection with vascular, bone, soft tissue, orbit, & intracranial invasion → "dry gangrene". Axial post-contrast T1W images demonstrate (a) absent mucosal enhancement of the sphenoid sinuses and superior turbinates (long arrows), left cavernous sinus thrombosis (arrowhead), thrombus in the left internal carotid artery (short arrow). (b) Dry gangrene in the superior turbinate, sphenoid sinus and cavernous sinus on the left (arrows), and (c) has spread to the nasal septum and left masticator space. The lack of enhancement over the nasal turbinate has been named the "black turbinate sign".



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



### 急性侵袭性真菌性鼻-鼻窦炎

**>-< 进阶知识**

对于免疫功能低下的患者（老年糖尿病患者或接受化疗者），急性鼻窦炎属于医疗急症。毛霉菌病可能迅速进展为干性坏疽（图 50）。

CECT 结合软组织窗和骨窗，可在急诊情况下评估软组织浸润和骨质侵蚀情况。

不过，在评估毛霉菌病的眶内和颅内侵犯范围、明确受累区域程度方面，MRI 更具优势。在 MRI 上，受累区域表现为无强化病灶。

**<!> 注意**

**需入院并紧急行 MRI 检查，这必不可少。CT 可能仅能显示“冰山一角”！**

**图 50**

64 岁男性，有急性白血病病史，拔牙后出现严重额部头痛和面部感觉异常。诊断为急性侵袭性真菌性鼻-鼻窦炎：为快速进展（数小时至数天）的跨黏膜真菌鼻窦感染，伴血管、骨、软组织、眼眶及颅内侵犯，进而发展为“干性坏疽”。轴位增强后 T1W 图像显示 (a) 蝶窦和上鼻甲黏膜无强化（长箭头）；左侧海绵窦血栓形成（箭头）；左侧颈内动脉内有血栓（短箭头）。(b) 上鼻甲、蝶窦和左侧海绵窦出现干性坏疽（箭头）。(c) 病变已扩散至鼻中隔和左侧咀嚼肌间隙。鼻甲无强化，称为“黑色鼻甲征”。

# / Tonsillitis and Peritonsillar Abscess

## / Tonsillitis

**Tonsillitis:** refers to inflammation of any of the tonsils and is the most common head and neck infection in adolescents and young adults. Patients present with dysphagia, fever, tender cervical lymph nodes, ear pain and occasionally trismus (depending on the severity). Usually caused by group A beta-hemolytic streptococci but may be viral in origin (adenovirus, CMV or herpes).

Imaging is **not** indicated in uncomplicated cases and is a clinical diagnosis.

If left untreated this may spread to the peritonsillar space and form a peritonsillar abscess (see next page). Infection can spread to the adjacent neck spaces including (amongst others) the supraglottis (**Fig. 51**). Epiglottitis may sometimes ensue. It is a life-threatening condition especially in children due to the risk of airway compromise. Diagnosis is clinical. CT is only obtained when diagnosis is uncertain however extreme caution should be exercised as placing a child in the supine position can precipitate respiratory arrest.

**FIGURE 51**

Axial contrast enhanced CT in a 31-year-old female patient presenting with painful facial and submandibular swelling. CRP 400. There is oedema of the epiglottis (asterix) and fluid in the submandibular space (double arrows)



**CHAPTER OUTLINE:**







# / 扁桃体炎和扁桃体周围脓肿

**章节大纲：**



## / 扁桃体炎

**扁桃体炎**：指任意扁桃体发生的炎症，是青少年和年轻成人中最常见的头颈部感染性疾病。患者表现为吞咽困难、发热、颈部淋巴结触痛、耳痛，偶尔会出现牙关紧闭（取决于病情严重程度）。通常由 A 组 β-溶血性链球菌引起，但也可能由病毒导致（腺病毒、巨细胞病毒或疱疹病毒）。

在无并发症的病例中，影像学检查**并非必需**，依靠临床诊断即可。

若未予治疗，感染可能扩散至扁桃体周围间隙，形成扁桃体周围脓肿（见下一页）。感染还可扩散至相邻的颈部间隙，包括声门上区（**图 51**）等区域。有时可能继发会厌炎。这是一种危及生命的疾病，在儿童中尤为危险，因为存在气道梗阻风险。诊断主要依靠临床。仅在诊断不明确时才进行 CT 检查，但操作时需极度谨慎，因为让儿童处于仰卧位可能诱发呼吸停止。

**图 51**

本例为 31 岁女性患者，因面部及颌下肿胀伴疼痛就诊，行轴位增强 CT 检查。CRP 400。影像显示会厌水肿（星号），下颌下间隙有积液（双箭头）

# / Peritonsillar Abscess

**Peritonsillar abscess (also known as quinsy)** is the most common deep neck space infection complicating acute or recurrent tonsillitis. Usually caused by beta-hemolytic streptococci. Unilateral odynophagia, altered voice quality, trismus and excessive drooling are highly indicative of a peritonsillar abscess.

Imaging Modalities:

CT scan of the neck after contrast administration (CECT) is 75% specific and 100% sensitive for this diagnosis (**Fig. 52**). It is also useful to exclude the presence of other associated complications such as septic thrombophlebitis of the internal jugular vein (Lemierre syndrome).

- US is unable to delineate the true extent of the infection.
- Treatment is always by surgical aspiration or incision and drainage. Conversely tonsillitis is managed with antibiotics.
- An important differential diagnosis is an intratonsillar (also known as tonsillar) abscess.

**Tonsillar abscess** is an uncommon complication of tonsillitis occurring in both children and adults presenting with sore throat and fever for several days. CECT is indicated depending on the clinical situation. It easily demonstrates an abscess within the palatine tonsil. Medical management is usually undertaken in the acute setting. This may be followed by an elective tonsillectomy at a later stage.

**FIGURE 52**

Axial contrast enhanced CT in a 31-year-old female patient presenting with painful facial and submandibular swelling. CRP 400. There is oedema of the epiglottis (asterix) and fluid in the submandibular space (double arrows).

**<∞> REFERENCE**

Capps EF, Kinsella JJ, Gupta M, Bhatki AM, Opatowsky MJ. Emergency imaging assessment of acute, nontraumatic conditions of the head and neck. Radiographics. 2010 Sep;30(5):1335-52. doi: 10.1148/rg.305105040. Erratum in: Radiographics. 2011 Jan-Feb;31(1):316. PMID: 20833854.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 扁桃体周围脓肿

**扁桃体周围脓肿**（也称为脓性蜂窝织炎）是最常见的深部颈部间隙感染，可并发于急性或复发性扁桃体炎。通常由 β-溶血性链球菌引起。单侧吞咽痛、音质改变、牙关紧闭和大量流涎高度提示扁桃体周围脓肿。

**影像学检查方法：**

颈部 CECT 对该疾病诊断的特异性为 75%，敏感性为 100%（**图 52**）。它还有助于排除其他相关并发症，如颈内静脉脓毒性血栓性静脉炎（Lemierre 综合征）。

- US 无法准确显示感染的真实范围。
- 治疗方法为手术抽吸或切开引流。相反，扁桃体炎采用抗生素治疗。
- 扁桃体内（也称为扁桃体）脓肿是一个重要的鉴别诊断。

**扁桃体脓肿**是扁桃体炎的一种不常见并发症，儿童和成人均可发病，表现为咽喉痛和发热数天。是否行 CECT 检查需根据临床情况决定。它可清晰显示腭扁桃体内的脓肿。急性期通常采用药物治疗。之后可能会择期行扁桃体切除术。

**图 52**

本例为 31 岁女性患者，因面部及颌下肿胀伴疼痛就诊，行轴位增强 CT 检查。CRP 400。影像显示会厌水肿（星号），下颌下间隙有积液（双箭头）。

**<∞> 参考文献**

Capps EF, Kinsella JJ, Gupta M, Bhatki AM, Opatowsky MJ. Emergency imaging assessment of acute, nontraumatic conditions of the head and neck. Radiographics. 2010 Sep;30(5):1335-52. doi: 10.1148/rg.305105040. 勘误：Radiographics. 2011 Jan-Feb;31(1):316. PMID: 20833854.

# Sialolithiasis and Sialadenitis including Autoimmune Conditions

## Sialolithiasis

**Sialolithiasis** Is the most common disease of the salivary glands. 80-90% of stones occur in the submandibular gland with the remaining 10-20% affecting the parotid gland. Uric acid stones may form in gout - the only systemic disease known to produce salivary stones.

Imaging Modalities:

- **Plain film** with up to 80% of submandibular and 60% of parotid stones visible on this modality.
- **Non-contrast CT or CBCT** is highly sensitive for small stones not otherwise visible on plain films. Non-calcified stones and duct dilatation are best observed with sialographic studies.
- **US** is able to visualise the stone (Fig. 53) and the gland itself. It can also identify radiolucent stones. Small stones (<2mm) may however be missed on US. US can also confirm the presence of acute sialadenitis if present.
- **Conventional sialography:** Main indication is **chronic** parotid or submandibular sialadenitis. **Acute** sialadenitis is a contraindication. Irregular pooling of contrast and ductal obstruction without calculi are indirect signs of malignancy. Disadvantages include radiation exposure, non-visualisation of gland parenchyma, allergic reactions to iodinated contrast material (**> see eBook chapter on Contrast Agents**).
- **MR sialography (MRS):** no contrast injection is necessary for ductal assessment as MRS uses fluid-sensitive sequences with saliva appearing as hyperintense on heavily T2W sequences (**Fig. 54**). Acute sialadenitis is **not** a contraindication to MRS. MRS can also diagnose incidental gland pathology.

**<!> ATTENTION**

**Although MRS has a poorer spatial resolution compared to conventional sialography, it has a similar diagnostic performance as conventional sialography for calculi, ductal stenoses and autoimmune pathology (Sjögren's). In many institutions, it has entirely replaced conventional sialography.**

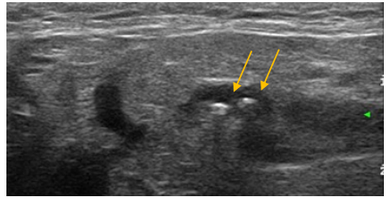


**FIGURE 53**

Targeted US scan of the submandibular gland in a lady with swelling and pain of the right submandibular region after eating. US shows stones (arrows) impacted within a dilated duct.

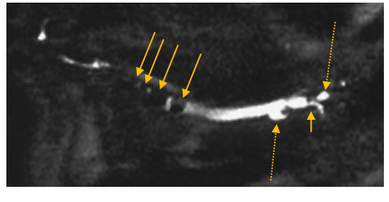


**FIGURE 54**

MR sialography (sagittal view) of the right submandibular gland showing multiple calculi (arrows) in Wharton's duct. Note dilatation of the duct, formation of small sialoceles (dashed arrows) and strictures (short arrow) typical of chronic sialadenitis. Saliva is strongly hyperintense while calculi appear as hypointense filling defects.



**Head and Neck Imaging**

**CHAPTER OUTLINE:**







**头颈部影像学**

# 涎石病和涎腺炎（包括自身免疫性疾病）

**章节大纲：**



## 涎石病

涎石病是涎腺最常见的疾病。80%~90% 的结石发生于下颌下腺，其余 10%~20% 累及腮腺。痛风患者可能形成尿酸结石，痛风是目前已知唯一可导致涎石形成的系统性疾病。

影像学检查方法：

- 多达 80% 的下颌下腺结石和 60% 的腮腺结石可在平片上显影。
- 平扫 CT 或 CBCT 对平片无法显示的小结石高度敏感。非钙化性结石和导管扩张在涎管造影检查中显示最佳。
- US 可显示结石（图 53）及腺体本身。还能识别透光性结石。但小于 2mm 的小结石可能漏诊。若存在急性涎腺炎，US 也可证实其存在。
- 常规涎管造影：主要适应证为慢性腮腺或下颌下涎腺炎。急性涎腺炎是其禁忌症。对比剂的不规则聚积以及非结石性导管梗阻，是恶性肿瘤的间接征象。其劣势包括存在辐射暴露、无法显示腺体实质、碘对比剂可能引发过敏反应（> 请参阅《对比剂》电子书章节）。
- MR 涎管造影 (MRS)：进行导管评估时无需注射造影剂，因为 MR 涎管造影 (MRS) 采用液体敏感序列，唾液在重 T2W 序列上呈高信号（图 54）。急性涎腺炎并非 MR 涎管造影 (MRS) 的禁忌证。MR 涎管造影 (MRS) 还可诊断偶然发现的腺体病变。

**<!> 注意**

**尽管与常规涎管造影相比，MR 涎管造影 (MRS) 的空间分辨率较低，但在诊断结石、导管狭窄以及自身免疫性疾病（如舍格林综合征）方面，其诊断效能与常规涎管造影相近。目前，在许多医疗机构，MR 涎管造影 (MRS) 已完全取代常规涎管造影。**

**图 53**

一位女性在进食后出现右侧下颌下区域肿胀和疼痛，对其下颌下腺进行靶向 US 扫描。US 显示扩张的导管内有结石（箭头）嵌顿。

**图 54**

右侧下颌下腺的 MR 涎管造影 (MRS)（矢状位），显示沃顿管内有多个结石（箭头）。可见导管扩张、小的涎腺囊肿形成（虚线箭头）以及狭窄（短箭头），这是慢性涎腺炎的典型表现。唾液呈明显高信号，而结石表现为低信号充盈缺损。

# / Sialadenitis

**Sialadenitis** is inflammation of the salivary glands. It can be acute or chronic.

**Acute** sialadenitis is a clinical diagnosis which can be treated medically. The role of imaging is to exclude complications such as intraglandular abscess or to exclude obstructing calculi.

**Chronic** sialadenitis needs further evaluation by imaging to determine the cause and assess the ductal system. Sialectasis is dilatation of the ducts which is due to a variety of causes including infective and autoimmune (such as Sjögren's syndrome, **Fig. 55**)

Imaging Modalities:

1. **US** can assess the size and architecture of gland parenchyma. In Sjögren's syndrome the gland is coarse and heterogenous with multiple dilated peripheral ducts.
2. **Conventional sialography:** depicts the presence of sialectasis and helps determine its severity. Disadvantages include radiation dose, allergic reactions to iodinated contrast material, and that sometimes the radiologist might not be able to cannulate or opacify the ducts due to severe stenoses.
3. **MR sialography:** Is highly sensitive for the detection of sialectasis even during very early stages. It can identify concurrent/incidental pathology within the gland. MR sialography can be combined with routine contrast-enhanced MRI sequences for improved lesion assessment.

**<!> ATTENTION**

**There is no role for CT in this clinical scenario.**

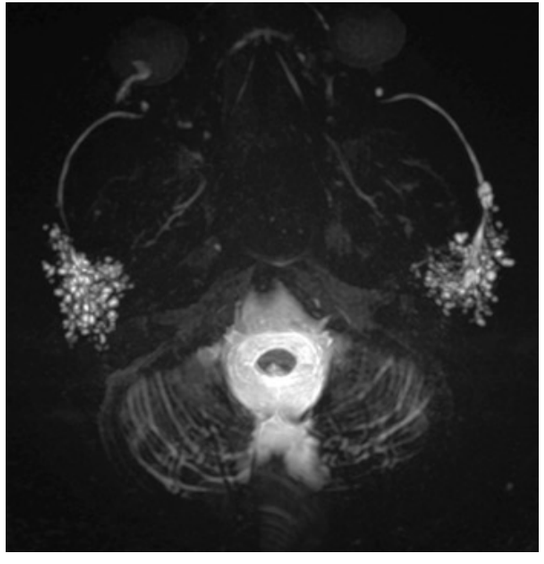


**FIGURE 55**

Gentleman in his 30's, poorly controlled diabetic, presenting with recurrent episodes of sialadenitis. Axial image from a volume rendered MR sialography showing multiple dilated peripheral ducts presenting as "microcysts" typical of Sjögren's syndrome.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 涎腺炎

涎腺炎是涎腺的炎症。可分为急性或慢性。

急性涎腺炎属于临床诊断，可通过药物治疗。影像学检查的作用是排除腺体内脓肿等并发症，或排除造成梗阻的结石。

慢性涎腺炎需要通过影像学进一步评估，以明确病因并检查导管系统。涎管扩张指导管扩张，可由多种原因引起，包括感染性和自身免疫性因素（如舍格林综合征，**图 55**）。

影像学检查方法：

1. **US** 可评估涎腺实质的大小和结构。在舍格林综合征中，涎腺表现为回声粗糙、不均匀，伴多发扩张的外周导管。
2. **常规涎管造影：**可显示涎管扩张情况，并有助于判断其严重程度。劣势包括存在辐射暴露、对含碘对比剂的过敏反应，以及有时因导管严重狭窄，放射科医生可能无法插管或使导管显影。
3. **MR 涎管造影 (MRS)：**对涎管扩张的检测敏感性极高，即使在疾病极早期阶段也能发现。它可识别涎腺内同时存在的/偶然发现的病变。MR 涎管造影 (MRS) 可与常规增强 MRI 序列相结合，以更好地评估病变。

**<!> 注意**

**在此临床场景中，CT 无诊断价值。**

**图 55**

一名 30 多岁、糖尿病控制不佳的男性，反复出现涎腺炎发作。容积再现 MR 涎管造影 (MRS) 的轴位图像显示，多发扩张的外周导管表现为“微囊肿”，这是舍格林综合征的典型表现。

# / Lymphadenitis

## / Tuberculous (TB) Cervical Lymphadenitis

**Tuberculous (TB) cervical lymphadnitis** (sometimes referred to as scrofula) is the commonest manifestation of extrapulmonary TB in endemic areas, as well as in the immunocompromised population and intravenous drug abusers.

In contrast to suppurative bacterial lymphadenitis, these lymph nodes are not tender have less inflammatory changes in the overlying skin. If left untreated, they may discharge spontaneously.

### Imaging modalities

Contrast enhanced CT. If TB is suspected a CT of the neck and chest should be obtained in order to look for evidence of pulmonary disease.

Appearance of this disease entity is quite characteristic on CT and MRI (Fig. 56) and manifests as a conglomerate of neck nodes with central necrosis and thick, peripheral enhancement along with regional inflammatory changes.

**<!> ATTENTION**

**TB lymph nodes should not be confused with necrotic metastatic lymphadenopathy from squamous cell carcinoma which may look similar (Fig. 57.) . The clinical history is extremely important including history of smoking, alcohol abuse and ethnicity (is the patient coming from a country where TB is endemic?).**

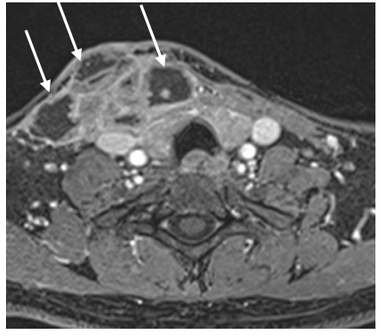


**FIGURE 56**

Axial, contrast enhanced, fat-suppressed T1W sequence obtained in a 37-year-old lady who presents with a right sided neck lump. There is a multiloculated mass in the right lower neck (arrows) extending anterior the thyroid gland, demonstrating solid and cystic components and reaching the skin. This was biopsy proven tuberculous lymphadenitis.

**FIGURE 57**

53 y/o man presenting with a 2-month history of neck swelling, progressive dysphagia, weight loss and hemoptysis. Contrast enhanced CT scan of the neck at the level of the epiglottis demonstrating extensive metastatic right cervical lymphadenopathy (asterisks).



**/ Head and Neck Imaging**

**CHAPTER OUTLINE:**







**/ 头颈部影像学**

**章节大纲：**



# / 淋巴结炎

## / 结核性 (TB) 颈淋巴结炎

**结核性 (TB) 颈淋巴结**（有时也称为淋巴结核）是流行地区肺外结核最常见的表现，在免疫功能低下人群和静脉药物滥用者中也较为常见。

与化脓性细菌性淋巴结炎不同，这类淋巴结无触痛，其上方皮肤的炎性改变也较轻。若未予治疗，它们可能会自行破溃排脓。

### 影像学检查方法

增强 CT。若怀疑结核 (TB)，应行颈部和胸部 CT 检查，以寻找肺部疾病的证据。

该疾病在 CT 和 MRI 上的表现具有特征性（图 56），表现为颈部淋巴结融合成团，伴中央坏死、厚壁环形强化，以及局部炎性改变。

**<!> 注意**

**结核性 (TB) 淋巴结不应与鳞状细胞癌所致的坏死性转移性淋巴结病相混淆，二者表现可能相似（图 57）。临床病史至关重要，包括吸烟史、酗酒史以及种族（患者是否来自结核病流行国家？）。**

**图 56**

轴位增强脂肪抑制 T1W 序列显示，一名 37 岁女性，右侧颈部肿块。右侧下颈部可见多房性肿块（箭头所示），延伸至甲状腺前方，显示出实性和囊性成分，并达皮下。活检证实为结核性淋巴结炎。

**图 57**

53 岁男性，有颈部肿胀、进行性吞咽困难、体重减轻和咯血 2 个月病史。颈部会厌水平的增强 CT 扫描显示右侧颈部广泛转移性淋巴结（星号）。

# / Suppurative Lymphadenitis and Reactive Lymph Nodes

**Suppurative lymphadenitis** is inflammation of the lymph nodes which undergo liquefactive necrosis if left untreated, which may require drainage. This is more common in children although it can occur in elderly diabetics or immunocompromised patients. Bacterial infection is the commonest cause of suppurative cervical adenitis (due to Staph aureus and group A Streptococcus).

Imaging Modalities:

**Ultrasound:** to identify the presence of abscess formation and guide drainage. If deep neck space involvement is suspected, then contrast enhanced CT is warranted. This will help determine the epicenter of the lesion and its extent prior to aspiration or surgical drainage.

**Reactive lymph nodes:** the most common cause in children includes viral illnesses of the upper respiratory tract; in young adults one should consider EBV (infectious mononucleosis). The lymph nodes maintain an oval shape albeit enlarged. They may exceed 2cm in size.

**Ultrasound** to assess the internal architecture. It can be difficult to distinguish reactive lymph nodes from low-grade lymphoma and when in doubt US guided core biopsy is indicated. If there is suspicion of malignancy, contrast enhanced CT or MRI should be performed.

If the lymph nodes are supraclavicular or in the posterior triangle of the neck, they should raise the suspicion of malignancy.

CHAPTER OUTLINE:









# / 化脓性淋巴结炎和反应性淋巴结

**化脓性淋巴结炎**是淋巴结的炎症，若不治疗，会发生液化性坏死，可能需要引流。虽然它在老年糖尿病患者或免疫功能低下的患者中也可能发生，但在儿童中更为常见。细菌性感染是化脓性颈部淋巴结炎最常见的病因（由金黄色葡萄球菌和 A 组链球菌引起）。

影像学检查方法：

**US**：用于确定脓肿是否形成并引导引流。若怀疑累及颈部深部间隙，需进行增强 CT 检查。这有助于在抽吸或手术引流前确定病变的中心位置及其范围。

**反应性淋巴结**：儿童最常见的病因包括上呼吸道病毒感染；对于年轻人，应考虑 EB 病毒（传染性单核细胞增多症）。淋巴结虽增大，但仍保持椭圆形。大小可能超过 2 厘米。

利用 US 评估内部结构。有时难以区分反应性淋巴结与低级别淋巴瘤，存疑时需行 US 引导下的粗针穿刺活检。若怀疑恶性，应进行增强 CT 或 MRI 检查。

若淋巴结位于锁骨上或颈部后三角区，应怀疑恶性可能。

章节大纲：

# / Otomastoiditis and Complications

**Otomastoiditis** can be acute or chronic and refers to inflammation of the middle ear and mastoid air cells. The chronic type is due to Eustachian tube dysfunction. The diagnosis of acute mastoiditis remains clinical.

The **acute** type is usually due to bacterial infection and is the commonest complication of acute otitis media (**Fig. 58**). Incipient otomastoiditis can progress to acute coalescent mastoiditis which can be complicated by the following:

- / Subperiosteal abscess
- / Bezold abscess
- / Labyrinthitis
- / Epidural abscess
- / Subdural empyema
- / Cerebral abscess
- / Dural venous sinus thrombosis

### Imaging modalities

Contrast enhanced CTallows assessment of erosion of the bony structures (including of the mastoid air cell bony septae – coalescent mastoiditis, and of the lateral wall of the mastoid process) and identification of subperiosteal and Bezold abscesses, as well as intracranial abcesses (epidural, subdural or intracerebral).

> see eBook chapter on Central Nervous System

**<!> ATTENTION**

**Contrast enhanced MRI of the temporal bone is more sensitive for assessing intracranial complications and to identify the presence of labyrinthitis.**


**FIGURE 58**

Post-contrast CT shows (a) right coalescent mastoiditis (black arrowhead) and ipsilateral sigmoid sinus thrombosis (black arrow) – both complications of otomastoiditis. CT with bone window settings (b) better depicts the right coalescent mastoiditis (black arrow). Note contralateral mastoid effusion.





**CHAPTER OUTLINE:**







# / 中耳乳突炎及其并发症



**章节大纲：**



**中耳乳突炎**可分为急性和慢性，指的是中耳和乳突气房的炎症。慢性型由咽鼓管功能障碍引起。急性乳突炎的诊断仍以临床为主。

**急性型**通常由细菌性感染引起，是急性中耳炎最常见的并发症（**图 58**）。早期中耳乳突炎可进展为急性融合性乳突炎，可能引发以下并发症：

- / 骨膜下脓肿
- / 贝佐尔德脓肿
- / 迷路炎
- / 硬膜外脓肿
- / 硬膜下积脓
- / 脑脓肿
- / 硬脑膜静脉窦血栓形成

### 影像学检查方法

增强 CT 能够评估骨质结构（包括乳突气房间隔-融合性乳突炎，以及乳突外侧壁）的侵蚀情况，还可识别骨膜下脓肿、贝佐尔德脓肿，以及颅内脓肿（硬膜外、硬膜下或脑内脓肿）。

> 请参阅《中枢神经系统》电子书章节

**<!> 注意**

**颞骨增强 MRI 对评估颅内并发症以及识别迷路炎的存在更为敏感。**

**图 58**

增强后 CT 显示 (a) 右侧融合性乳突炎（黑色箭头）和同侧乙状窦血栓形成（黑色箭头），均为中耳乳突炎的并发症。骨窗 CT (b) 更清晰地显示右侧融合性乳突炎（黑色箭头）。注意对侧乳突积液。

# Malignant Tumours



## Head and Neck Imaging

## 头颈部影像学

**CHAPTER OUTLINE:**



**章节大纲：**

# 恶性肿瘤

# / Squamous Cell Carcinoma

## / Nasopharynx

Squamous cell carcinoma (SCC) is the most common malignant primary in the head and neck and is classified and staged according to its location (nasopharynx, oropharynx, larynx, oral cavity and sinonasal) and following the **TNM manual** of the UICC (Union Internationale contre le Cancer).

**<!> ATTENTION**

/ Best imaging modality for this region is MRI (**Fig. 59**). One of the reasons is that this type of cancer is staged according to the degree of locoregional spread and many of the soft tissues are better delineated with MRI particularly in the presence of skull base invasion and intracranial extension.

**Nasopharyngeal carcinoma:**

/ MRI also allows staging of cervical lymph node involvement.

/ PETCT is employed to identify the presence of distant metastatic spread. Nasopharyngeal carcinoma can metastasise to the liver, lungs and bones.

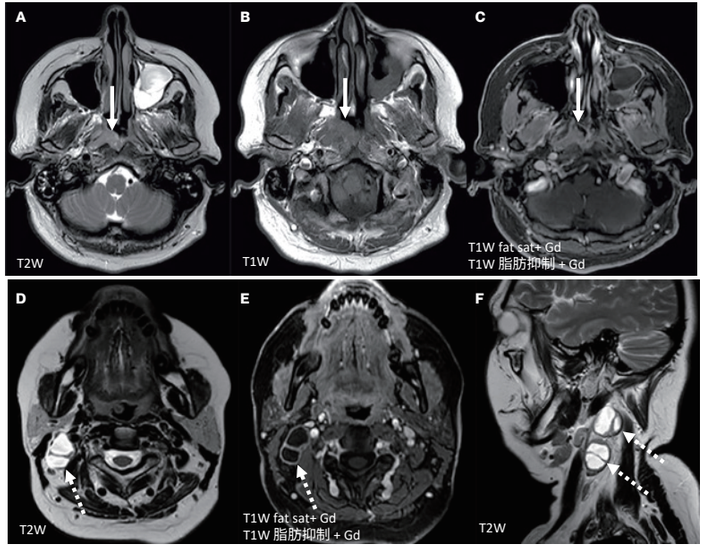



**FIGURE 59**

Axial MRI showing a small SCC of the right nasopharynx (white arrows), exhibiting intermediate signal on the T2W sequence (a), low signal on T1W (b), and homogenous enhancement on the fat suppressed T1W sequence (c). Ipsilateral necrotic lymph nodes (dashed arrows) are seen on the axial T2W (d), and fat suppressed T1W (e) and on the sagittal T2 sequence (f). Patient (40-year-old lady) presented with a painless right sided neck lump.





**CHAPTER OUTLINE:**









**章节大纲：**



# / 鳞状细胞癌

## / 鼻咽部

SCC 是头颈部最常见的原发恶性肿瘤，根据其发生部位（鼻咽、口咽、喉部、口腔和鼻窦），并依照国际抗癌联盟 (Union Internationale contre le Cancer, UICC) 的 **TNM** 手册进行分类和分期。

**<!> 注意**

/ 该区域的最佳影像学检查方法是 MRI（图 **59**）。原因之一是这类癌症根据局部区域扩散程度进行分期，而借助 MRI 能更好地显示许多软组织情况，尤其在存在颅底侵犯和颅内蔓延时。

**鼻咽癌：**

/ MRI 还可对颈部淋巴结受累情况进行分期。

/ PET-CT 用于确定是否存在远处转移。鼻咽癌可转移至肝脏、肺部和骨骼。

**图 59**

轴位 MRI 显示右侧鼻咽部的一个小 SCC（白色箭头），在 T2W 序列 (a) 上呈中等信号，在 T1W 序列 (b) 上呈低信号，在脂肪抑制 T1W 序列 (c) 上呈均匀强化。在轴位 T2W 序列 (d)、脂肪抑制 T1W 序列 (e) 以及矢状位 T2 序列 (f) 上，可见同侧坏死性淋巴结（虚线箭头）。患者为一名 40 岁女性，表现为右侧无痛性颈部肿块。

# / Oral Cavity

**<!> ATTENTION**

**Oral cavity squamous cell carcinoma (SCC) (Figs. 60-63):**

- Best imaging modality for this region is MRI. MRI is also be able to pick up lesions which would otherwise be obscured by dental streak artefacts if imaged with CT (see page 38)
- MRI also allows also staging of cervical lymph nodes
- In cases of advanced disease, PETCT may also be employed to identify the presence of distant metastatic spread

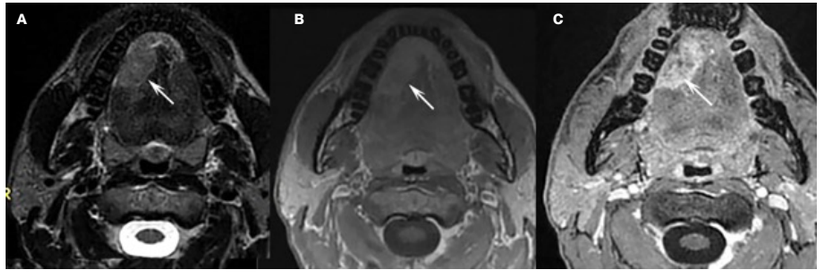



**FIGURE 60**

Axial MRI of an oral cavity SCC shows a solid mass involving the left lateral border of the tongue showing intermediate signal intensity on T2 sequence (a), and homogenous enhancement on the non-fat suppressed T1 (b) and fat suppressed T1 (c) indicated by the white arrow in each case.

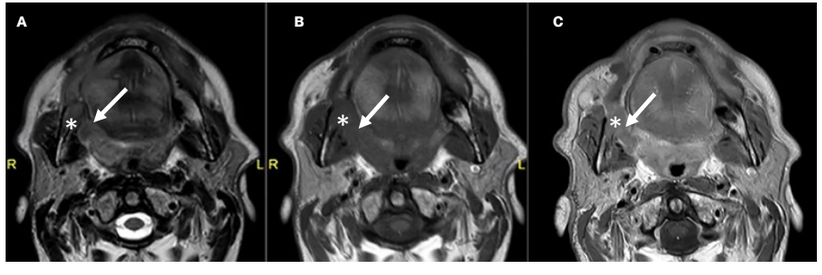



**FIGURE 61**

Axial MRI of a right retromolar trigone lesion – here MRI is crucial for accurate locoregional staging. (a) T2W (b) pre-contrast T1 and (c) post-contrast T1, each show an infiltrative mass originating in the retromolar trigone (white arrow) and invading the adjacent angle of the mandible (asterisk).



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 口腔

**<!> 注意**

口腔 SCC（图 60～63）：

- 该区域的最佳影像学检查方法是 MRI。若用 CT 检查，牙科条纹伪影可能会掩盖病变，而 MRI 能够发现这些易被掩盖的病变（见第 38 页）。
- MRI 还可对颈部淋巴结进行分期。
- 对于晚期病变，也可采用 PET-CT 来确定是否存在远处转移。

**图 60**

口腔 SCC 的轴位 MRI 显示，有一个实性肿块累及舌左缘，在 T2 序列 (a) 上呈中等信号，在非脂肪抑制 T1 序列 (b) 和脂肪抑制 T1 序列 (c) 上呈均匀强化，各序列中均由白色箭头标示。

**图 61**

对于右侧磨牙后三角区病变，轴位 MRI 对准确进行局部区域分期至关重要。(a) T2W、(b) 平扫 T1 和 (c) 增强后 T1，均显示一个浸润性肿块起源于磨牙后三角区（白色箭头），并侵犯相邻的下颌角（星号）。

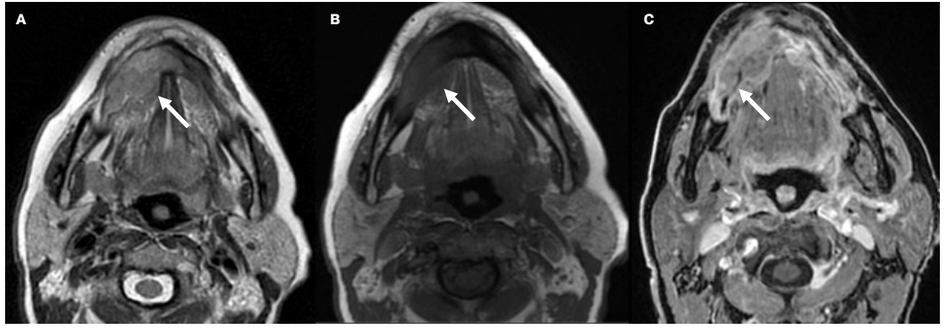



**FIGURE 62**

Axial MRI in a 69y/o patient shows an extensive lesion in the right mandibular alveolar mucosa with bone invasion and involving the floor of mouth and buccal mucosa. (a) It has an intermediate signal on T2, with profoundly low signal in the affected marrow on T1 (b, arrow). (c) The lesion enhances homogenously on the fat suppressed T1 sequence (arrow). This case delineates how MRI can clearly show marrow invasion precluding the need for CT particularly in advanced cases. Conversely integration with CT would be useful in instances where the presence of cortical erosion is equivocal.


**FIGURE 63**

Superficial neoplasms may be associated with cortical invasion which is subtle and this is best assessed with CT as in this case. (a) Coronal reformatted image from a post-contrast CT with soft tissue window settings shows a small superficial lesion involving the gingiva of the right hemimaxilla (arrow). (b) Same image with bone window settings highlights subtle cortical erosion (dashed arrow) which might be more difficult to identify on MRI.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



**图 62**

一位 69 岁患者的轴位 MRI 显示，右侧下颌牙槽黏膜有广泛病变，伴有骨质侵犯，且累及口底和颊黏膜。(a) 病变在 T2 上呈中等信号，在 T1（b，箭头）上，受累骨髓区呈明显低信号。(c) 在脂肪抑制 T1 序列上，病变呈均匀强化（箭头）。此病例展示了 MRI 如何清晰显示骨髓侵犯，尤其在晚期病例中，从而无需再行 CT 检查。 相反，若骨皮质侵蚀情况难以确定时，结合 CT 检查会有帮助。

**图 63**

表浅肿瘤可能伴有细微的骨皮质侵犯，对此，最佳评估方法是 CT，如本例所示。(a) 软组织窗增强 CT 冠状位重建图像显示右侧上颌骨有一个累及牙龈的表浅小病变（箭头）。(b) 同一图像以骨窗显示，可清晰凸显细微的骨皮质侵蚀（虚线箭头），而这在 MRI 上可能更难识别。

**Squamous cell carcinoma (SCC)** is by far the most common (98%) primary tumour of the larynx.

It occurs in men over 50 and is associated with smoking and alcohol abuse.

Classification is based on the subsite involved: supraglottic (20–30%), glottic (50–60%), subglottic (5%), and transglottic (spanning two or more subsites). The subsite will determine the clinical presentation, as well as management.

Glottic carinomas (**Fig. 64**) often present earlier with dysphonia. They rarely metastasise due to the poor lymphatic drainage of the glottis.

Supraglottic carcinomas (**Fig. 65**) are often asymptomatic, thus usually present later purporting a much poorer prognosis. Symptoms are due to lymphadenopathy or trans-spatial spread, such as tender neck mass, sore throat, dysphagia/odynophagia, or referred ear pain.

Subglottic carcinomas typically present with dyspnea and/or stridor.

**<!> ATTENTION**

**Imaging modalities:** best choice contrast-enhanced CT (CECT) or MRI. CT has less motion artefacts. CT needs to be obtained with thin slices and dedicated reformats. MRI is superior to CT to assess cartilaginous and extra-laryngeal invasion; however, MRI may be problematic if the patient is non-compliant because of dyspnea.

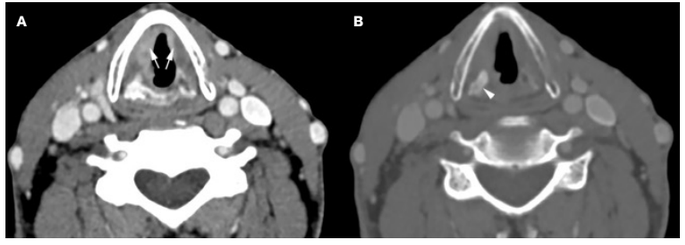



**FIGURE 64**

61y/o M presenting with irregular ulcerated lesions along both true vocal cords at endoscopy. (a) Axial contrast enhanced CT image (soft tissue window settings) shows a lesion centered on the glottis bilaterally larger on the right (arrows). (b) Same image in bone window settings shows sclerosis of the right arytenoid cartilage (arrowhead), which can indicate cartilage invasion.

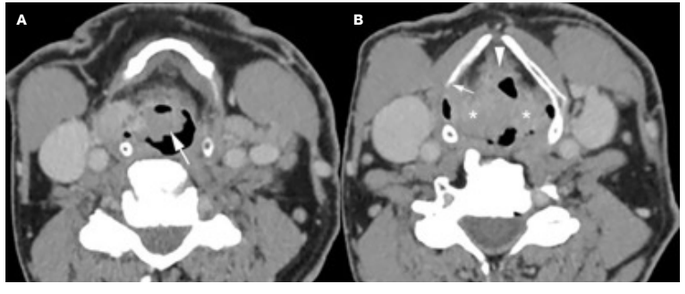



**FIGURE 65**

64 y/o M, with right sided throat pain and hoarseness. A supraglottic tumour was seen endoscopically. Contrast enhanced CT shows a lesion partly exophytic (arrow in a), involving both aryepiglottic folds (asterisks in b), invading the pre-epiglottic fat (arrowhead) and coming into contact with the inner margin of the right thyroid cartilage (arrow in b).



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



SCC 是目前为止喉部最常见（占 98%）的原发性肿瘤。

它好发于 50 岁以上男性，与吸烟和酗酒相关。

其分类基于累及的亚部位：声门上型 (20%～30%)、声门型 (50%～60%)、声门下型 (5%) 以及跨声门型（累及两个或更多亚部位）。亚部位会决定临床表现和治疗方式。

声门型癌（图 64）常较早出现发声困难。由于声门区淋巴引流少，这类癌症很少发生转移。

声门上型癌（图 65）往往无症状，因此通常发现较晚，预后也差得多。症状由淋巴结病或跨间隙扩散引起，比如颈部肿块压痛、咽喉痛、吞咽困难/吞咽痛，或牵涉性耳痛。

声门下型癌通常表现为呼吸困难和/或喘鸣。

**<!> 注意**

**影像学检查方法：最佳选择是 CECT 或 MRI。CT 的运动伪影较少。进行 CT 检查时需采用薄层扫描和专门的图像重组。在评估软骨及喉外侵犯方面，MRI 优于 CT；不过，若患者因呼吸困难难以配合，MRI 检查可能会有问题。**

**图 64**

一名 61 岁男性，内窥镜检查发现双侧真声带存在不规则溃疡性病变。(a) 轴位增强 CT 图像（软组织窗）显示，一双侧性病变以声门为中心，右侧范围更大（箭头）。(b) 同一图像以骨窗显示，右侧杓状软骨硬化（箭头），这可能提示软骨受侵犯。

**图 65**

一名 64 岁男性，右侧咽喉痛伴声音嘶哑。内镜下发现声门上肿瘤。增强 CT 显示，病变部分呈外生性（a 中的箭头），累及双侧杓会厌襞（b 中的星号），侵犯会厌前间隙（箭头），并与右侧甲状软骨内缘接触（b 中的箭头）。

# / Sinonasal Tumours

For the evaluation of sinonasal tumours, CT and MRI are complementary. Both imaging modalities must be obtained as MRI allows distinction between tumour and associated peri-tumoral inflammation while CT allows improved assessment of subtle bone erosion/destruction.

**Fig. 66 and 67 illustrate** a histologically proven carcinosarcoma. This is a highly malignant tumour.

This case highlights the importance of multimodality imaging (CT and MRI, particularly the latter) for better tissue characterisation and anatomical delineation. There is much overlap between different malignant entities and histological correlation is crucial.

Important findings to look for include:

/ Bone destruction
/ Intracranial invasion
/ Intraorbital invasion
/ Perineural spread

**<∞> REFERENCE**

Hasnaoui J, Anajar S, Tatari M, et al. Carcinosarcoma of the maxillary sinus: A rare case report. Ann Med Surg (Lond). 2017).

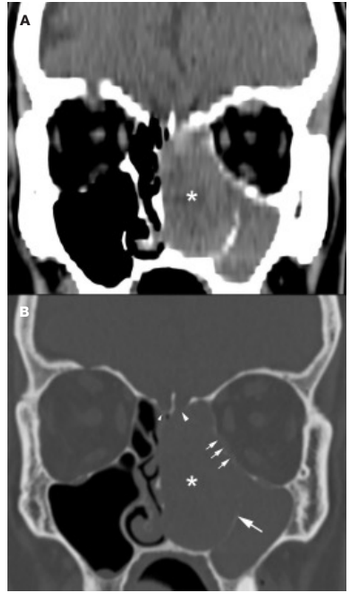



**FIGURE 66**

Coronal reformatted images from a non-contrast CT in soft tissue window (a) and bone window settings (b). The mass (asterisk) causes resorption of the cribriform plate (arrowhead) and lamina papyracea (short arrows) and lateral bowing of the medial wall of the left maxillary sinus.

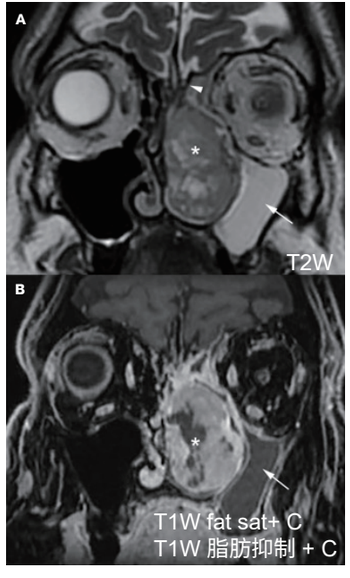



**FIGURE 67**

Coronal MRI shows a solid mass in the left nasal cavity (asterisk in a & b). (a) T2W: the lesion abuts the left cribriform plate which is still intact (arrowhead) and pushes the lamina papyracea laterally. (b) it enhances avidly after contrast with a small area of central necrosis. Retained secretions in the left maxillary sinus are indicated by arrow.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 鼻腔鼻窦肿瘤

对于鼻腔鼻窦肿瘤的评估，CT 和 MRI 具有互补性。这两种影像学检查都必须进行，因为 MRI 能够区分肿瘤和相关的瘤周炎症，而 CT 则有助于更好地评估细微的骨质侵蚀/破坏情况。

**图 66 和图 67** 展示了经组织学证实的癌肉瘤。这是一种高度恶性的肿瘤。

该病例凸显了多模态成像（CT 和 MRI，尤其后者）的重要性，有助于更好地进行组织特征分析和解剖结构显示。不同恶性肿瘤之间存在诸多重叠表现，与组织学进行对照至关重要。

需要关注的重要表现包括：

/ 骨质破坏
/ 颅内侵犯
/ 眶内侵犯
/ 神经周围扩散

**图 66**

来自平扫 CT、经冠状位重组的图像，分别为软组织窗 (a) 和骨窗 (b)。肿块（星号）导致筛板（箭头）和纸样板（短箭头）骨质吸收，以及左侧上颌窦内侧壁向外侧膨出。

**图 67**

冠状位 MRI 显示左侧鼻腔内有实性肿块（a 和 b 中的星号）。(a) T2W：病变紧邻左侧筛板，筛板仍完整（箭头），并将纸样板向外侧推移。(b) 增强后病变明显强化，中央有小范围坏死区。箭头所示为左侧上颌窦内的潴留分泌物。

**<∞> 参考文献**

Hasnaoui J, Anajar S, Tatari M, et al. Carcinosarcoma of the maxillary sinus: A rare case report. Ann Med Surg (Lond). 2017).

# / Lymphoma

**Lymphoma (Fig. 68.)** can be subdivided into Hodgkin's and Non-Hodgkin's lymphoma.

**Hodgkin's lymphoma (HL)** primarily involves the lymph nodes with only 5% arising in extranodal sites. It most often affects the lymph nodes of the neck and chest.

**Non-Hodgkin's lymphoma (NHL)** presents at extranodal sites in up to 30% of cases. Marginal zone lymphoma (a subtype of NHL) has an affinity for the orbit, salivary glands, larynx and thyroid gland. Diffuse large B cell lymphoma is commonly encountered in the paranasal sinuses, mandible, maxilla and Waldeyer ring.

The imaging modality of choice includes CT, PET CT and MRI (**Fig. 68**). These can suggest the diagnosis of a lymphoproliferative disorder but cannot distinguish HL from NHL. Furthermore, different subtypes of both HL and NHL exist which will dictate the treatment needed. A histological diagnosis is always warranted via core biopsy (normally ultrasound guided), in order to provide this information.

**Contrast enhanced CT (CECT)** is indicated for evaluation of cervical lymph nodes; the chest, including the mediastinum; the pelvic cavity; paranasal sinuses; and orbits. CT is also useful for detection of bone destruction involving the base of the skull, paranasal sinuses, and the mandible or maxilla.

**MRI** is useful to assess extranodal lymphoma, particularly when there is involvement of the orbit, thyroid, salivary glands, larynx, skull base, and to detect intracranial extension. It is also useful to demonstrate marrow infiltration of the spine which may not be apparent on a CT scan.

**PETCT** is used for pretreatment staging and to monitor treatment response.


**FIGURE 68**

Axial T2W MR sequence shows left sided pathological lymph nodes (arrows) spanning levels II and VA in a patient with histologically confirmed diffuse large B cell lymphoma.

**<∞> REFERENCE**

Weber AL, Rahemtullah A, Ferry JA. Hodgkin and non-Hodgkin lymphoma of the head and neck: clinical, pathologic, and imaging evaluation. Neuroimaging Clin N Am. 2003 Aug;13(3):371-92. doi: 10.1016/s1052-5149(03)00039-x. PMID: 14631680.











# / 淋巴瘤

淋巴瘤（图 68）可分为霍奇金淋巴瘤和非霍奇金淋巴瘤。

**霍奇金淋巴瘤 (HL)** 主要累及淋巴结，仅 5% 起源于结外部位。最常累及颈部和胸部的淋巴结。

**非霍奇金淋巴瘤 (NHL)** 中，高达 30% 的病例发生于结外部位。边缘区淋巴瘤（非霍奇金淋巴瘤 (NHL) 的一个亚型）好发于眼眶、涎腺、喉和甲状腺。弥漫性大 B 细胞淋巴瘤常见于鼻旁窦、下颌骨、上颌骨和韦氏环。

可选的影像学检查方法包括 CT、PET-CT 和 MRI（图 68）。这些检查可提示淋巴增生疾病的诊断，但无法区分霍奇金淋巴瘤 (HL) 和非霍奇金淋巴瘤 (NHL)。此外，霍奇金淋巴瘤 (HL) 和非霍奇金淋巴瘤 (NHL) 均有不同亚型，而亚型会决定所需的治疗方案。为获取这些信息，始终需要通过（通常在 US 引导下进行的）粗针穿刺活检进行组织学诊断。

**CECT** 适用于评估颈部淋巴结、胸部（包括纵隔）、盆腔、鼻旁窦和眼眶。CT 还有助于检测累及颅底、鼻旁窦、下颌骨或上颌骨的骨质破坏情况。

**MRI** 有助于评估结外淋巴瘤，尤其当病变累及眼眶、甲状腺、涎腺、喉、颅底，以及检测颅内侵犯时。它还有助于显示脊柱的骨髓浸润情况，而这种浸润在 CT 扫描中可能不明显。

**PET-CT** 用于治疗前分期和监测治疗反应。

**图 68**

轴位 T2W MR 序列显示，左侧病理性淋巴结（箭头），累及 II 区和 VA 区，该患者经组织学证实为弥漫性大 B 细胞淋巴瘤。

**<∞> 参考文献**

Weber AL, Rahemtullah A, Ferry JA. Hodgkin and non-Hodgkin lymphoma of the head and neck: clinical, pathologic, and imaging evaluation. Neuroimaging Clin N Am. 2003 Aug;13(3):371-92. doi: 10.1016/s1052-5149(03)00039-x. PMID: 14631680.

# / Thyroid Cancer

**Malignant thyroid lesions (Figs. 69-70)** are classified as follows:

- / Primary thyroid cancers
- / Thyroid lymphoma (primary thyroid lymphoma or secondary thyroid involvement with lymphoma)
- / Metastases to the thyroid (1%)
- / Squamous cell carcinoma (rare)

**Primary thyroid cancer** can be subclassified into papillary, follicular, medullary and anaplastic carcinoma. Papillary is the commonest type accounting for 60-80% of carcinomas and anaplastic the rarest form (1-2%).

The **best imaging modality for assessment** of the thyroid gland is **ultrasound (US) followed by MRI**.

US:

**ADVANTAGES:**

- \+ Non-invasive
- \+ Widely available
- \+ Helps guide minimally invasive procedures such as fine needle aspirations and core biopsies

**DISADVANTAGES:**

- – Operator dependent
- – Unable to identify deep seated metastatic lymph nodes lying behind the manubrium sterni or behind the clavicle
- – Unable to characterise retrosternal thyroid goiters

**MRI:** is useful for the assessment of deep spread & lymph node staging.

**FIGURE 69**

16-year-old lady presenting with hard right neck lump confirmed to be papillary ca on cytology. US shows strongly hypoechoic lesion with microcalcifications (arrows) in the right thyroid lobe breaching the capsule and invading the strap muscles.


**FIGURE 70**

66 y/o lady presenting with a rapidly growing mass over the left side of her neck and hoarseness. Axial CECT images show a medialised left aryepiglottic fold with effacement of the pyriform sinus indicative of vocal cord paralysis (arrowhead in A), a large necrotic mass replacing the left thyroid lobe and invading the strap muscles (arrow in B) and infiltrating the region of the left recurrent laryngeal nerve in the trachea-oesophageal groove (arrow in C). This was a histologically proven anaplastic thyroid carcinoma.

**<∞> REFERENCE**

https://radiopaedia.org/articles/thyroid-malignancies
Read More: https://www.ajronline.org/doi/full/10.2214/ajr.13.11673?mobileUi=0



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 甲状腺癌

恶性甲状腺病变（图 69～70）分类如下：

- / 原发性甲状腺癌
- / 甲状腺淋巴瘤（原发性甲状腺淋巴瘤或淋巴瘤累及甲状腺的继发性病变）
- / 甲状腺转移瘤（占 1%）
- / 鳞状细胞癌（罕见）

**原发性甲状腺癌**可进一步分为乳头状癌、滤泡癌、髓样癌和未分化癌。乳头状癌是最常见的类型，占甲状腺癌的 60%～80%，未分化癌则最为罕见（占 1%～2%）。

**评估甲状腺的最佳影像学检查方法是 US，其次是 MRI。**

US：

**优点：**

- \+ 无创
- \+ 广泛普及
- \+ 有助于引导微创操作，如细针穿刺抽吸和粗针穿刺活检

**缺点：**

- – 操作者依赖性
- – 无法识别位于胸骨柄后方或锁骨后方的深部转移性淋巴结
- – 无法对胸骨后甲状腺肿的特征进行评估

**MRI：**有助于评估深部侵犯情况以及进行淋巴结分期。

**图 69**

16 岁女性，右侧颈部坚硬肿块，细胞学检查确诊为乳头状癌。US 显示甲状腺右侧叶内有明显低回声病变，伴微钙化（箭头），病变突破包膜并侵犯带状肌。

**图 70**

66 岁女性，左侧颈部肿块迅速增大伴声音嘶哑。轴位 CECT 图像显示，左侧杓会厌襞向内侧移位伴梨状窝受压消失，提示声带麻痹（A 中的箭头）；有巨大坏死性肿块取代甲状腺左侧叶并侵犯带状肌（B 中的箭头）；肿块浸润气管-食管沟内左侧喉返神经区域（C 中的箭头）。经组织学证实为甲状腺未分化癌。

**<∞> 参考文献**

https://radiopaedia.org/articles/thyroid-malignancies
Read More: https://www.ajronline.org/doi/full/10.2214/ajr.13.11673?mobileUi=0

**CT** is necessary in the presence of metastases, which are more common in follicular thyroid cancer (which tends to spread haematogenously to the bones and liver), as well as in medullary and anaplastic carcinomas. It can also be helpful to assess the degree of local extension, particularly when there is intrathoracic extension.

**Thyroid imaging reporting and data system (TI-RADS)** is a classification system based on US features to help categorise thyroid lesions into benign, borderline and malignant lesions (TI-RADS 1 being a normal thyroid gland, TI-RADS 6 representing biopsy proven malignancy).

**Fine needle aspiration** is a minimally invasive procedure which involves obtaining a sample from the thyroid nodule of concern, which can then be examined by the pathologist. US is performed to guide the needle. The procedure is contraindicated in patients with coagulopathy, which is refractory to treatment or who have a platelet disorder.

**Radioiodine scan:** There are two types, the diagnostic and post-therapy studies.

- **Whole-body scan (WBS)** with radioiodine (131I) is the most effective method for tumour detection, staging, and treatment planning. Iodine-131-WBS is useful for determining tumour differentiation on the basis of its avidity to iodine, identifying remnant thyroid tissue, and evaluating for distant metastatic disease. This scan is usually obtained before radioiodine therapy.
- **The therapeutic scan** again uses radioiodine – I-131- as ablation therapy for patients post-thyroidectomy. This is because normally a surgeon performs a near total-thyroidectomy in order to preserve parathyroid function and because of the difficulty in location deeply seated thyroid tissue. The radioiodine scan can then be used to ablate the residual thyroid tissue.

**PET CT:** Most well-differentiated thyroid carcinomas (DTC) are relatively slowly growing and can be FDG negative. Therefore, the role of FDG PET/CT in the management of patients with DTC is primarily limited to postoperative follow-up. Because only 4–7% of patients with DTC present initially with distant metastasis, the routine use of an initial staging PET is not indicated. Although FDG PET does not provide information beyond that yielded by ultrasound for local preoperative assessment of thyroid cancer, several studies have reported that it has a sensitivity of up to 85% and specificity of up to 95% for distant metastases in patients with DTC (i.e., papillary and follicular carcinoma).

<!> ATTENTION

> See also eBook chapter on Endocrine System

<∞> REFERENCE

TIRADS > refer to https://radiopaedia.org/articles/thyroid-imaging-reporting-and-data-system-ti-rads.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



若存在转移灶，CT 检查是必要的。转移在甲状腺滤泡癌（倾向于经血行转移至骨骼和肝脏）、髓样癌和未分化癌中更为常见。CT 还有助于评估局部侵犯程度，尤其当肿瘤向胸腔内侵犯时。

**甲状腺影像报告和数据系统 (TI-RADS)** 是一种基于 US 特征的分类系统，用于将甲状腺病变分为良性、交界性和恶性病变（TI-RADS 1 代表正常甲状腺，TI-RADS 6 代表经活检证实的恶性肿瘤）。

**细针穿刺抽吸**是一种微创手术，需从可疑的甲状腺结节中获取样本，随后由病理医生进行检查。US 用于引导穿刺针。 对于患有难以控制的凝血障碍或血小板疾病的患者，该操作是禁忌的。

**放射性碘扫描：**分为诊断性扫描和治疗后扫描两种类型。

- 采用放射性碘 (131I) 的**全身扫描 (WBS)** 是肿瘤检测、分期和治疗规划最有效的方法。碘-131-WBS 有助于根据肿瘤对碘的摄取能力判断肿瘤分化情况、识别残余甲状腺组织，以及评估远处转移性疾病。 该扫描通常在放射性碘治疗前进行。
- **治疗性扫描**同样使用放射性-I-131，用于甲状腺切除术后患者的消融治疗。通常外科医生会实施近全甲状腺切除术，目的是保留甲状旁腺功能，同时也是因为深部甲状腺组织定位困难。随后，可采用放射性碘扫描来消融残余甲状腺组织。

**PET-CT：**大多数高分化型甲状腺癌 (DTC) 生长相对缓慢，且可能表现为 FDG 阴性。因此，FDG PET/CT 在高分化型甲状腺癌 (DTC) 患者诊疗中的应用主要局限于术后随访。由于仅有 4%～7% 的高分化型甲状腺癌 (DTC) 患者初诊时就存在远处转移，所以常规使用 PET 进行初始分期并无必要。虽然在甲状腺癌原发灶的术前评估方面，FDG PET 提供的信息并不比 US 更多，但多项研究表明，对于高分化型甲状腺癌 (DTC)（即乳头状癌和滤泡癌）患者的远处转移，FDG PET 的敏感度可达 85%，特异度可达 95%。

<!> 注意

> 另请参阅《内分泌系统》电子书章节

<∞> 参考文献

TIRADS > refer to https://radiopaedia.org/articles/thyroid-imaging-reporting-and-data-system-ti-rads.

# / Multidisciplinary Tumour Boards

**<!> ATTENTION**

The **importance of multidisciplinary tumour board (MDTB) meetings (Figs. 71-72)** cannot be overemphasised. They comprise a number of specialists including:

- / Otorhinolaryngologist/head and neck surgeon
- / Maxillofacial surgeon
- / Medical oncologist
- / Pathologist
- / Radiologist & nuclear medicine physician
- / Radiation oncologist

**FIGURE 71**

The various medical specialists meet and discuss imaging and pathology findings, as well as patient management.





**CHAPTER OUTLINE:**







# / 多学科肿瘤团队

**<!> 注意**

**多学科肿瘤团队 (MDTB) 会议（图 71~72）**再怎么强调都不为过。这类会议由众多专科医生参与，包括：

- / 耳鼻喉科医生/头颈外科医生
- / 颌面外科医生
- / 肿瘤内科医生
- / 病理科医生
- / 放射科医生及核医学科医生
- / 放疗科医生

**图 71**

各科医学专科医生汇聚一堂，讨论影像学和病理学检查结果，以及患者的诊疗方案。



**章节大纲：**

Tumour boards (MDTBs) constitute the **gold standard management strategy** for head and neck squamous cell carcinoma patients but not only. They are successfully implemented in the management of other non-malignant head and neck pathologies including indeterminate thyroid lesions, neurogenic tumours of the head and neck, odontogenic tumours, vascular malformations of the neck and face and many more!

**<!> ATTENTION**

**Clinical radiologists are pivotal members of MDTB meetings. Radiology incorporates both diagnostic and interventional radiologists, It is central to the diagnostic process along with the histopathologist and is thus crucial in reaching a diagnosis, thereby actively guiding management and treatment options.**

A study published in 2002 already showed that when head and neck cancer patients referred from tertiary centers were rediscussed at the MDTB and their cross-sectional imaging studies were re-assessed by a specialised head and neck radiologist, this **significantly impacted tumour staging and prognosis** (Loevner et al, 2002).

Another more recent study published in 2020 demonstrated a positive impact of MDTBs on head and neck cancer patients with **improved overall survival and disease specific survival** (Liu et al, 2020).

**<∞> REFERENCE**

Loevner LA, Sonners AI, Schulman BJ, Slawek K, Weber RS, Rosenthal DI, Moonis G, Chalian AA. Reinterpretation of cross-sectional images in patients with head and neck cancer in the setting of a multidisciplinary cancer center. AJNR Am J Neuroradiol. 2002 Nov-Dec;23(10):1622-6. PMID: 12427610; PMCID: PMC8185819.
Liu JC, Kaplon A, Blackman E, Miyamoto C, Savior D, Ragin C. The impact of the multidisciplinary tumor board on head and neck cancer outcomes. Laryngoscope. 2020 Apr;130(4):946-950. doi: 10.1002/lary.28066. Epub 2019 May 16. PMID: 31095740; PMCID: PMC7868105.

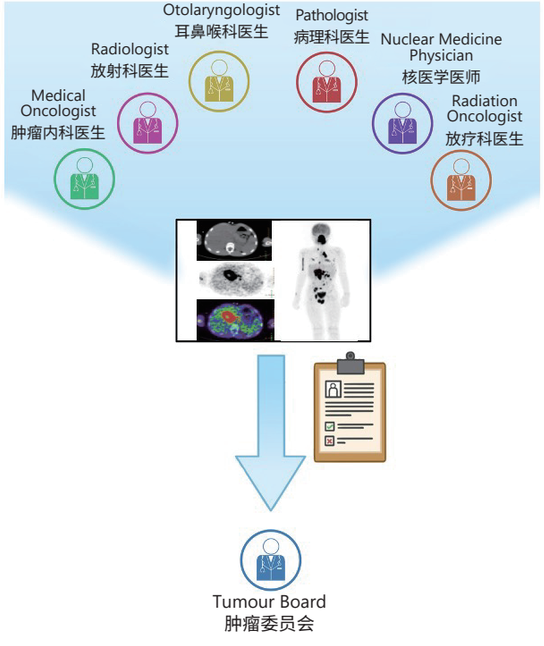



**FIGURE 72**

Schematic diagram depicting the members of a head and neck oncology multidisciplinary tumour board.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



肿瘤委员会（多学科肿瘤团队 (MDTB)）是头颈部 SCC 患者治疗策略的**金标准**，但不仅限于此。 它们在其他头颈部非恶性疾病的诊治中也成功应用，包括性质不确定的甲状腺病变、头颈部神经源性肿瘤、牙源性肿瘤、颈部和面部血管畸形等！

**<!> 注意**

**临床放射科医生是多学科肿瘤团队 (MDTB) 会议的关键成员。影像学团队涵盖诊断和介入放射科医生，它与组织病理学家同为诊断过程的核心，因此对确诊至关重要，进而积极指导治疗管理和治疗方案的选择。**

2002 年发表的一项研究已经表明，当三级中心转诊的头颈癌患者在多学科肿瘤团队 (MDTB) 上重新讨论，且其横断面影像学检查由专业的头颈部放射科医生重新评估时，这会显著影响**肿瘤分期和预后** (Loevner et al, 2002)。

另一项 2020 年发表的近期研究表明，多学科肿瘤团队 (MDTB) 对头颈癌患者有积极影响，**总体生存率和疾病特异性生存率均得到提高** (Liu et al, 2020)。

**<∞> 参考文献**

Loevner LA, Sonners AI, Schulman BJ, Slawek K, Weber RS, Rosenthal DI, Moonis G, Chalian AA. Reinterpretation of cross-sectional images in patients with head and neck cancer in the setting of a multidisciplinary cancer center. AJNR Am J Neuroradiol. 2002 Nov-Dec;23(10):1622-6. PMID: 12427610; PMCID: PMC8185819.
Liu JC, Kaplon A, Blackman E, Miyamoto C, Savior D, Ragin C. The impact of the multidisciplinary tumor board on head and neck cancer outcomes. Laryngoscope. 2020 Apr;130(4):946-950. doi: 10.1002/lary.28066. Epub 2019 May 16. PMID: 31095740; PMCID: PMC7868105.

**图 72**

头颈部肿瘤多学科肿瘤团队 (MDTB) 成员的示意图。

# Benign Tumours



CHAPTER OUTLINE:



章节大纲：





# 良性肿瘤

# / Lipoma

**Lipomas** are benign neoplasms composed of mature fat. 15% occur in the head and neck and up to 5% can be multiple.

**US** can be used as the initial investigation to assess these lesions. This will demonstrate a well-defined, compressible mass with no internal vascularity.

**<!> ATTENTION**

**US should be integrated with CT or MRI** as the latter two modalities are superior at demonstrating fat content and excluding complex internal features, i.e., enhancing solid tumour components or thick internal septations. In addition, they identify deep spread. The presence of solid or enhancing components at imaging suggest a liposarcoma.

**CT** and **MRI** (Fig.73) are also necessary for anatomical lesion delineation when surgery is being considered, particularly to identify the relationship to key structures, e.g., the accessory nerve in the case of posterior triangle lipomas.

**PET CT** has no role in imaging a lipoma and will not show any uptake. The presence of uptake on PET should raise the concern of a liposarcoma.

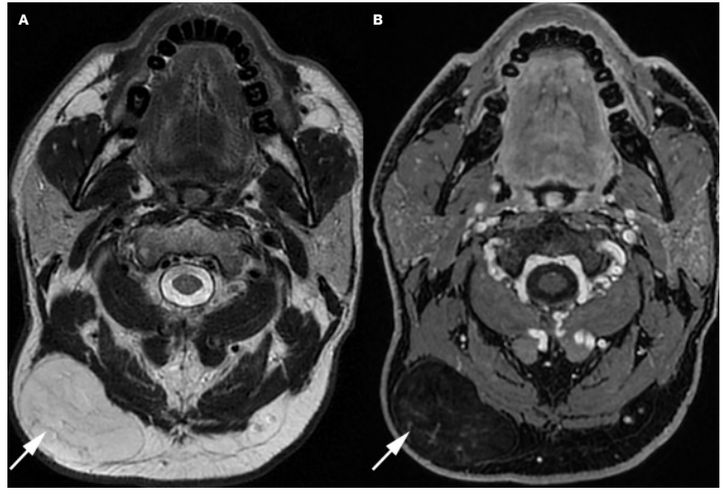



**FIGURE 73**

Axial T2W (a) and fat suppressed T1 post-contrast (b) MR images show a lipomatous mass (arrows) in the right posterior neck with no complex features such as suspicious internal enhancement or nodularity. Features are in keeping with a subcutaneous lipoma.





**CHAPTER OUTLINE:**







**章节大纲：**





# / 脂肪瘤

**脂肪瘤**是由成熟脂肪构成的良性肿瘤。15% 发生于头颈部，多达 5% 可为多发性。

US 可作为评估这些病变的首选检查方法。表现为边界清晰、可压缩的肿块，内部无血管。

**<!> 注意**

**US 应与 CT 或 MRI 相结合**，因为后两种检查方法在显示脂肪成分、排除复杂内部特征（如强化的实性肿瘤成分或增厚的内部分隔）方面更具优势。此外，还能显示深部侵犯情况。影像上显示实性或强化成分，提示为脂肪肉瘤。

当考虑手术时，CT 和 MRI（图 73）对于明确病变的解剖部位也是必须的，尤其有助于确定病变与关键结构的关系，例如颈后三角脂肪瘤与副神经的关系。

PET-CT 对脂肪瘤无作用，没有显像剂的摄取。若 PET 检查中出现摄取，应警惕脂肪肉瘤的可能。

**图 73**

轴位 T2W (a) 和脂肪抑制增强后T1 (b) MR 图像显示右侧颈后间隙脂肪瘤性肿块（箭头），无可疑内部强化或结节等复杂特征。表现符合皮下脂肪瘤。

# / Schwannoma

**Vestibular schwannomas, also called acoustic neuromas (Figs. 74-76)** represent 75% - 90% of cerebellopontine angle masses. Their yearly incidence is about 1 in 100,000 population.

Most solitary lesions are sporadic. The presence of **bilateral** vestibular schwannomas is pathognomonic for **neurofibromatosis type 2**.

**<!> ATTENTION**

**Vestibular schwannomas typically present with adult-onset sensorineural hearing loss or non-pulsatile tinnitus.**

**MRI with contrast is the examination method of choice.**

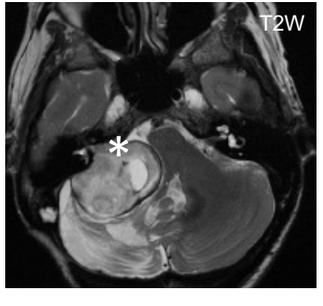



**FIGURE 75**

Large vestibulocochlear schwannoma (asterisk) causing severe compression of the cerebellum and pons.

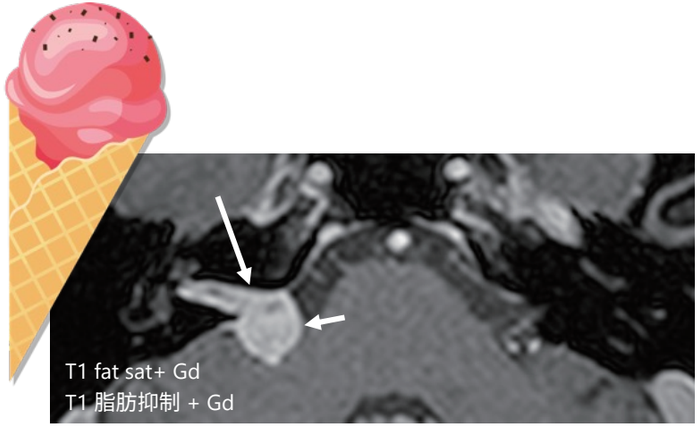



**FIGURE 74**

Vestibular schwannoma presenting as an enhancing internal auditory canal mass (long arrow) extending into the cerebello-pontine angle (short arrow) with a characteristic **ice-cream-on-cone appearance**.

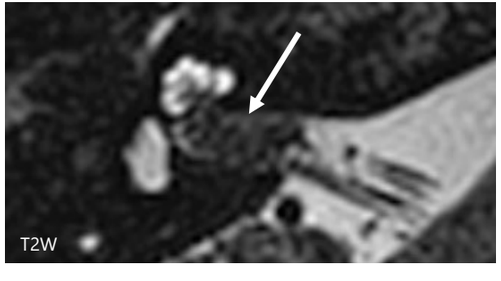



**FIGURE 76**

Intracanalicular schwannoma limited to the internal auditory canal.











# / 神经鞘瘤

前庭神经鞘瘤，也称为听神经瘤（图 74~76）占桥小脑角肿块的 75%~90%。其年发病率约为每 10 万人中有 1 例。

大多数孤立性病变为散发的。如有双侧前庭神经鞘瘤，可诊断神经纤维瘤病 2 型。

**<!> 注意**

**前庭神经鞘瘤通常表现为成年起病的感音神经性听力损失或非搏动性耳鸣。**

**增强 MRI 是最佳检查方法。**

**图 74**

前庭神经鞘瘤表现为内听道内强化的肿块（长箭），延伸至桥小脑角（短箭），呈特征性的“冰淇淋蛋筒”样表现。

**图 75**

大的前庭耳蜗神经鞘瘤（星号），导致小脑和脑桥严重受压。

**图 76**

内听道内神经鞘瘤局限于内听道。

Schwannomas (**Figs. 77- 79**) can be located anywhere in the head and neck, some examples including:

- **Oral cavity** arising from the lingual nerve. (**Fig. 77**)
- **Posterior triangle** of the neck (involving the brachial plexus (**Fig. 78**)
- **Carotid space** (involving any of the cranial nerves IX-XII and the sympathetic chain) at the level of the oropharynx or nasopharynx or more caudally at the level of the thyroid gland (**Fig. 79**)
- **Parotid gland** (arising from the facial nerve)

**<!> ATTENTION**

**The best imaging modality for the assessment of schwannomas and for distinguishing them from other lesions is MRI before and after iv. contrast administration.**

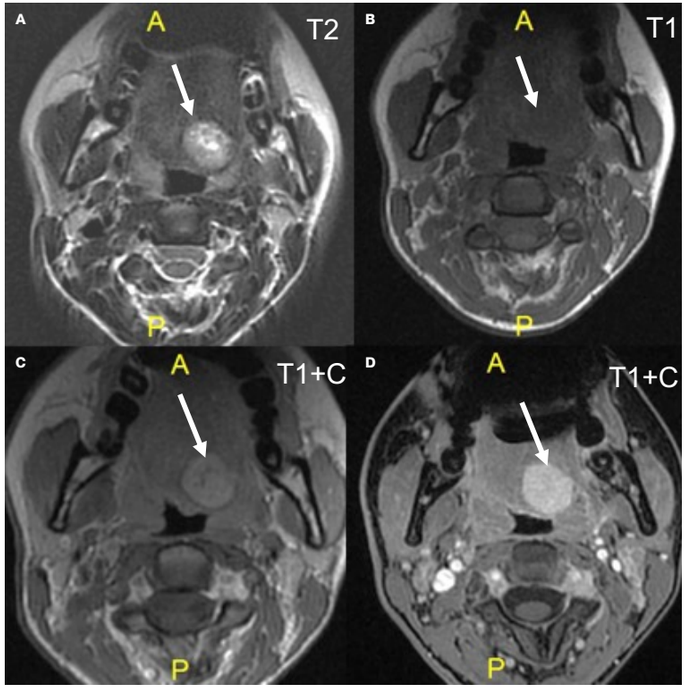



**FIGURE 77**

**Lingual nerve schwannoma** (**A**) Axial T2W, (**B**) T1, (**C**) T1 post-contrast and (**D**) fat suppressed T1 post-contrast, demonstrating a lingual schwannoma (arrows) on the left side of the tongue. A = anterior. P= posterior.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



神经鞘瘤（图 77～79）可位于头颈部的任何部位，以下是一些例子：

- 位于口腔内，起源于舌神经（图 77）
- 颈后三角（累及臂丛神经，图 78）
- 颈动脉间隙（累及第 IX～XII 对脑神经及交感链的任一神经），位于口咽、鼻咽或更靠下的甲状腺水平（图 79）
- 腮腺（起源于面神经）

**<!> 注意**

**评估神经鞘瘤并与其他病变鉴别的最佳影像学检查方法是平扫和增强后 MRI。**

**图 77**

**舌神经鞘瘤** (**A**) 轴位 T2W、(**B**) T1、(**C**) 增强后 T1 和 (**D**) 脂肪抑制增强后 T1 显示舌左侧的舌神经鞘瘤（箭头）。A = 前部。P = 后部。

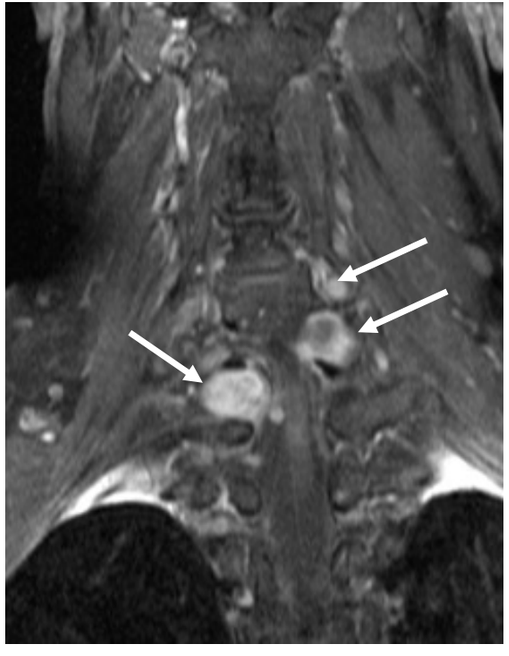


**FIGURE 78**

**Brachial plexus schwannomas.** Also sometimes referred to as peripheral nerve sheath tumours, the lesions appear as well-circumscribed fusiform masses (arrows) along the course of the brachial plexus and can also exhibit neural foraminal extension. This patient had neurofibromatosis type 2.

**FIGURE 79**

**Schwannoma of the cervical sympathetic chain** is a benign mass. The above image is an axial T2W MR image demonstrating a typical target sign (characteristic of neurogenic tumours) of the schwannoma (arrow).



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



**图 78**

**臂丛神经鞘瘤**。有时也称为周围神经鞘瘤，表现为沿臂丛走行的边界清晰的梭形肿块（箭头），也可出现神经孔侵犯。该患者有神经纤维瘤病 2 型。

**图 79**

**颈交感神经链神经鞘瘤**是良性肿块。上图为轴位 T2W MR 图像，显示神经鞘瘤（箭头）的典型靶征（神经源性肿瘤的特征性表现）。

# / Paraganglioma

**Paragangliomas** are tumours originating from neuroendocrine cells which are distributed throughout the body. Being related to the **autonomic nervous system** they can exhibit sympathetic or parasympathetic function depending on their location in the body and whether they have secretory function. They are mainly located in the adrenal medulla, the paravertebral space and the head and neck.

Paragangliomas in the head and neck may present with cranial nerve palsies due to mass effect, a neck mass or tinnitus.

**Parasympathetic** paragangliomas are predominantly found in the head and neck. They are typically non-secretory. They include:

- **Carotid body** paraganglioma (**Fig. 80**)
- **Glomus vagale** paraganglioma
- **Glomus tympanicum** paraganglioma

**<!> ATTENTION**

> See also eBook chapter on Endocrine System

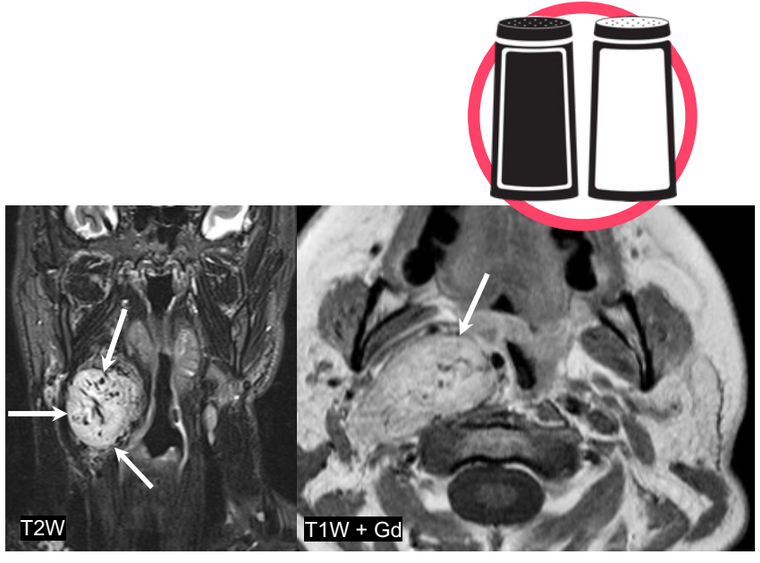



**FIGURE 80**

MR images show a paraganglioma (arrows) in the right carotid space with a very bright signal on T2, avidly enhancing after administration of contrast and with numerous internal low signal areas (flow-voids) due to enlarged intratumoural vessels giving it a characteristic salt and pepper appearance.











# / 副神经节瘤

**副神经节瘤**起源于全身分布的神经内分泌细胞的肿瘤。 由于与**自主神经系统**相关，根据其在体内的位置以及是否具有分泌功能，可表现出交感神经或副交感神经功能。副神经节瘤主要位于肾上腺髓质、椎旁间隙以及头颈部。

由于占位效应，头颈部副神经节瘤可表现为脑神经麻痹、颈部肿块或耳鸣。

**副交感神经**副神经节瘤主要见于头颈部，通常无分泌性。包括：

- 颈动脉体副神经节瘤（图 80）
- 迷走神经球副神经节瘤
- 鼓室球副神经节瘤

**<!> 注意**

> 另请参阅《内分泌系统》电子书章节

**图 80**

MR 图像显示右侧颈动脉间隙副神经节瘤（箭头），T2 呈高信号，增强后明显强化，肿瘤内有增粗的血管，内部有多个低信号区（血管流空），表现为特征性的“椒盐征”。

## CORE KNOWLEDGE

- Carotid body tumours arise from the paraganglion cells of the carotid body. Also known as chemodectomas, the tumours present as a slowly growing, painless, pulsatile masses. Catecholamine–secreting paragangliomas are rare.
- The CT and MR appearances are **pathognomonic** because carotid body tumours characteristically **splay** the external and internal carotid arteries causing the **"lyre sign" (Fig. 81)**. Carotid body paragangliomas are exquisitely vascular, thus demonstrating avid enhancement and flow voids on MRI (**Fig. 80**). Flow voids correspond to flow-related signal loss at MRI due to flowing blood with high velocity in patent vessels.
- **Bilateral lesions** may occur in 5-10% of cases and are common in inherited endocrine syndromes.

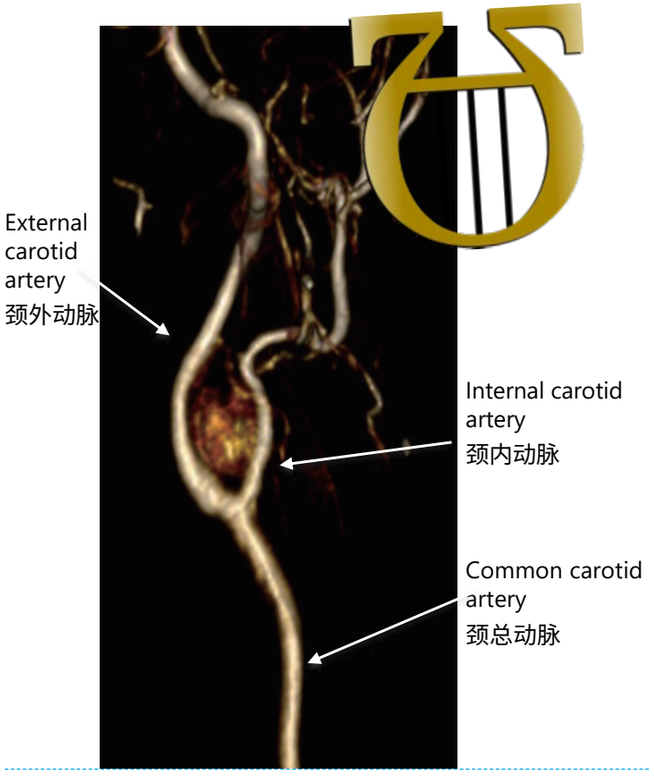



**FIGURE 81**

Carotid body tumours have a characteristic appearance on angiographic studies often described as the "lyre" sign as shown on this MRI angiography image.

## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



- 颈动脉体瘤起源于颈动脉体的副神经节细胞，也被称为化学感受器瘤，表现为生长缓慢、无痛、搏动性肿块。分泌儿茶酚胺的副神经节瘤罕见。
- 因为颈动脉体瘤将颈外动脉和颈内动脉**分开**，形成"**竖琴征**"（**图 81**），CT 和 MR 表现**具有特征性诊断意义**。颈动脉体副神经节瘤血供极其丰富，因此MRI 显示明显强化及血管流空（图 80）。血管流空是指由于开放血管内高速流动的血液，在 MRI 上出现与血流相关的信号丢失。
- 5%～10% 的病例可发生**双侧病变**，在遗传性内分泌综合征中较常见。

**图 81**

颈动脉体瘤在血管造影检查中有特征性表现，常被描述为"竖琴征"，如这幅 MRI 血管造影图像所示。

# / Pleomorphic Adenoma

**<!> ATTENTION**

These are **the most common salivary gland tumours**. They also account for 70-80% of benign salivary gland tumours. The parotid gland is the most commonly affected gland. The are less common in the smaller salivary glands (the letter having a higher predilection for malignant lesions).

Patients usually present with a smooth, painless, enlarging mass. They are associated with a small risk of malignant transformation into a carcinoma ex-pleomorphic adenoma, the risk rising to 9.5% after 15 years, therefore surgical excision is necessary.

While US can be used to identify the presence of an intraparotid lesion, the imaging findings are non-specific however it is useful in guiding fine needle aspiration cytology or biopsy.

MRI is the gold standard imaging modality for the following reasons:

1. It allows better characterisation of the lesion (**Fig. 82**) and identification of any malignant features
2. Can identify whether there is involvement of the deep lobe of the parotid gland, which would imply a total parotidectomy with potential risk of damage to the facial nerve
3. It has a high diagnostic performance to detect recurrent disease. While the risk of recurrence is small if total parotidectomy is performed, the risk is high if only enucleation was done initially

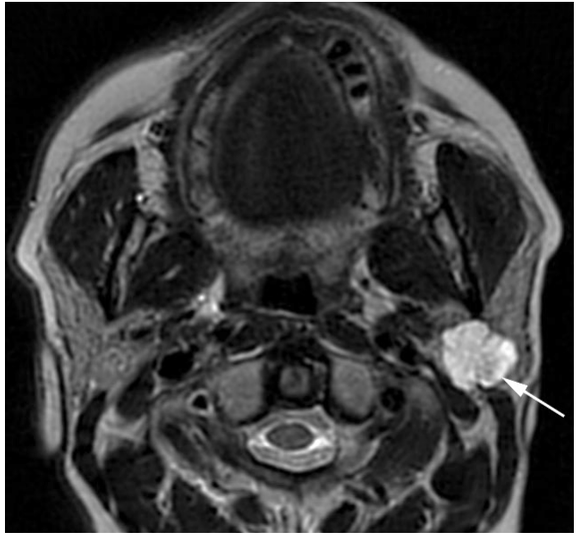


**FIGURE 82**

Axial MR image shows a lobulated lesion which is very hyperintense vs very bright on T2, involving both deep and superficial lobes. The bright signal on T2 is characteristic of pleomorphic adenomas, although schwannomas and haemangiomas can also have a high signal on T2.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 多形性腺瘤

**<!> 注意**

这些是**最常见的涎腺肿瘤**，占良性涎腺肿瘤的 70%~80%。腮腺是最常受累的腺体，在较小的涎腺中较少见（小涎腺发生恶性病变的倾向较高）。

患者通常表现为光滑、无痛、进行性增大的肿块。具有较小的恶变为多形性腺瘤癌变的风险，15 年后风险上升至 9.5%，因此需要手术切除。

虽然 US 可用于确定有无腮腺内病变，但影像学表现无特异性，不过其在引导细针抽吸细胞学检查或活检方面有用。

MRI 是影像学检查方法的金标准，原因如下：

1. MRI 能更好地对病变进行特征性分析（**图 82**），并识别任何恶性特征
2. 可确定是否累及腮腺深叶，若累及则意味着需行全腮腺切除术，且有损伤面神经的潜在风险
3. 对发现复发病变的诊断效能很高。若行全腮腺切除术，复发风险较小；若最初仅行肿瘤剜除术，复发风险则较高

**图 82**

轴位 MR 图像显示一个分叶状病变，在 T2 上呈明显高信号（即非常亮），累及腮腺深叶和浅叶。尽管神经鞘瘤和血管瘤在 T2 上也可呈高信号，但 T2 高信号是多形性腺瘤的特征性表现。

# Trauma



CHAPTER OUTLINE:



章节大纲：





# 外伤

# / Temporal Bone

Approximately 14-22% of patients with fractures of the skull will suffer from fractures of the temporal bone. About 90% of adults with temporal bone fractures also have intracranial injuries.

**<!> ATTENTION**

Temporal bone fractures (**Fig. 83**) may either run parallel to the long axis of the petrous bone (**longitudinal fracture**) or they may run perpendicular to it (**transverse fracture**). Longitudinal fractures are more common than transverse fractures. A combination of both fracture types may also occur (**comminuted fractures**).

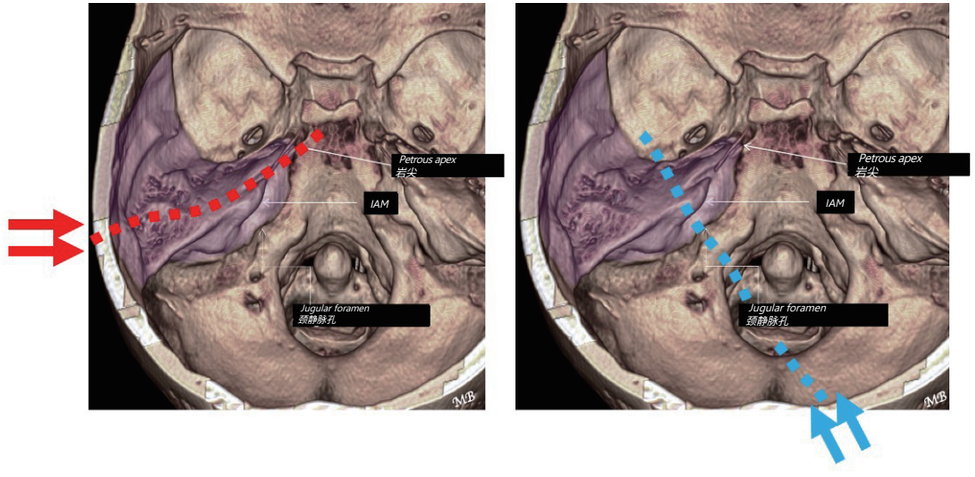



**FIGURE 83**

Illustration of the mechanisms leading to temporal bone fractures. These are 3D reconstructions (view from above) of a CT of the skull. The left temporal bone is highlighted in purple. Internal auditory meatus (IAM). In longitudinal fractures (red dashed line), the line of force (red arrows) runs from lateral to lateral. In transverse fractures (blue dashed line), it runs roughly from posterior to anterior (blue arrows).





**CHAPTER OUTLINE:**







# / 颞骨



**章节大纲：**



约 14%~22% 的颅骨骨折患者会发生颞骨骨折。约 90% 的成年颞骨骨折患者同时存在颅内损伤。

**<!> 注意**

**颞骨骨折（图 83）可平行于岩骨长轴（纵行骨折），也可垂直于岩骨长轴（横行骨折）。纵行骨折比横行骨折更常见。也可能出现两种骨折类型并存的情况（粉碎性骨折）。**

**图 83**

颞骨骨折致伤机制示意图。这些是颅骨 CT 的 3D 重组图像（俯视图）。左侧颞骨以紫色突出显示。内听道 (IAM)。在纵行骨折（红色虚线）中，力是侧侧传导方向（红色箭头）。在横行骨折（蓝色虚线）中，力从后到前的传导方向（蓝色箭头）。

Temporal bone fractures can also be classified depending on **involvement of the bony labyrinth** (otic capsule). When the fracture involves the ossicles, inner ear and facial nerve, the patient may present with hearing loss, vertigo and or facial nerve paralysis.

High resolution (thin slice) non-contrast CT scan (**Figs. 84-85**) is indicated for:

- Delineation of the fracture line in relation to the bony labyrinth (cochlea, semicircular canals and vestibule) and facial nerve
- Detection of ossicular dislocation
- Identification of air in the cranial cavity (pneumocephalus), temporal fossa and temporomandibular joint
- Identification of fluid in the mastoid air cells, middle ear and external auditory canal

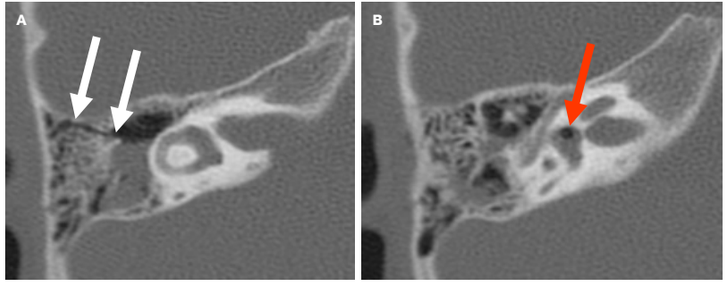



**FIGURE 84**

High resolution unenhanced CT of the temporal bones. (**A**) Longitudinal fracture (white arrows) of the right temporal bone with involvement of the otic capsule and pneumolabyrinth in (**B**). The red arrow points at an air bubble in the vestibule.

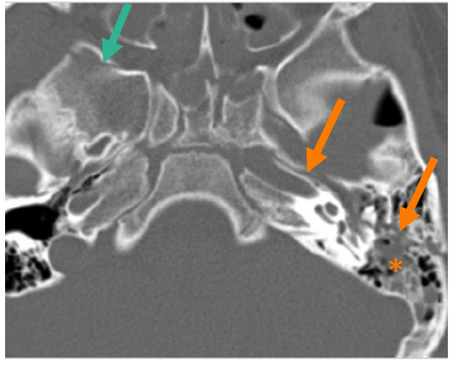


**FIGURE 85**

Longitudinal fracture of the left temporal bone (orange arrows) extending into the contralateral sphenoid bone (green arrow). Note fluid (asterisk) in the mastoid air cells and in the middle ear cavity due to hemotympanum.



## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



颞骨骨折也可根据是否**累及骨迷路**（耳囊）进行分类。当骨折累及听小骨、内耳和面神经时，患者可能出现听力损失、眩晕和/或面神经麻痹。

高分辨率（薄层）CT 平扫（**图 84~85**）适用于：

- 明确骨折线与骨迷路（耳蜗、半规管和前庭）及面神经的关系
- 观察听小骨脱位
- 发现颅腔（颅腔积气）、颞窝和颞下颌关节内的气体
- 发现乳突气房、中耳和外耳道内的液体

**图 84**

颞骨高分辨率 CT 平扫。(**A**) 右侧颞骨纵行骨折（白色箭号），累及耳囊和外伤性气迷路 (**B**)。红色箭头指向前庭内的气泡。

**图 85**

左侧颞骨纵行骨折（橙色箭头），延伸至对侧蝶骨（绿色箭头）。可见血鼓室导致的乳突气房和中耳腔内液体（星号）。

# / Larynx

Laryngeal trauma is uncommon but when encountered, it usually occurs in the following settings:

- / Following blunt trauma (particularly motor vehicle accidents)
- / Strangulation or hanging
- / Penetrating injury, such as knife or gunshot wound
- / Post-endotracheal intubation
- / After sneezing with a closed mouth

It can occur in association with other injuries such as fractures of the skull base and cervical spine, as well as thoracic and abdominal injuries.

Symptoms include hoarseness, laryngeal pain, dyspnoea, dysphagia, stridor, haemoptysis and subcutaneous emphysema.

**Post-contrast CT (Fig. 86)** is the best imaging modality in this regard. It enables assessment of the laryngeal cartilages and great vessels of the neck. The presence of a haematoma is highly suggestive of laryngeal fractures. CT is also necessary to grade the laryngeal injury (Schaefer system) for prognostication and management purposes.

**<!> ATTENTION**

**A history of trauma is key to reach the correct differential diagnosis and injury may be subtle, so a high index of suspicion is of paramount importance.**

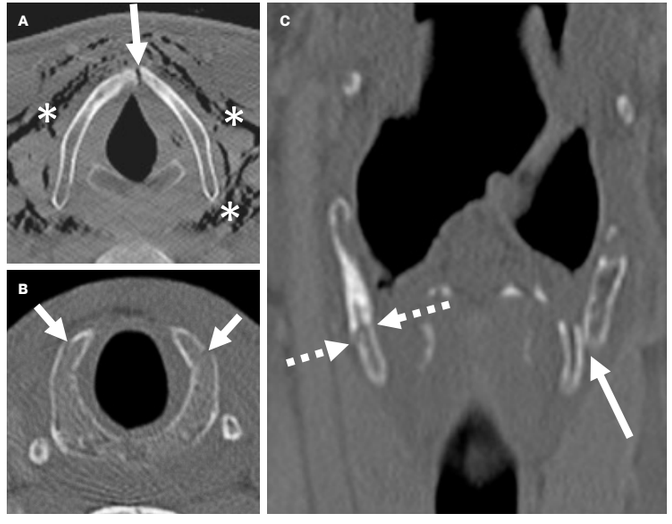



**FIGURE 86**

Three different patients with laryngeal trauma detected by CT. (**A**): Unstable midline fracture of the thyroid cartilage. Note massive soft tissue emphysema (air in the soft tissues of the neck indicated by asterisks). (**B**): Subtle, non-displaced bilateral fractures of the cricoid cartilage (arrows). (**C**): Bilateral fracture of the thyroid cartilage with a left inferiorly displaced fragment (solid arrow) and a right non-displaced fracture line (dashed arrows)



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 喉部

喉部创伤不常见，但发生时，通常发生在以下情况：

- / 钝器伤后（尤其是机动车事故）
- / 勒伤或缢伤
- / 穿透性损伤，如刀伤或枪伤
- / 气管内插管术后
- / 闭着嘴打喷嚏后

喉部创伤可能与其他损伤同时发生，如颅底骨折、颈椎骨折以及胸部和腹部损伤。

症状包括声音嘶哑、喉部疼痛、呼吸困难、吞咽困难、喘鸣、咯血和皮下气肿。

**增强后 CT（图 86）**是这方面最佳的影像学检查方法，能够评估喉部软骨和颈部大血管。血肿的存在高度提示喉部骨折。为了预后和治疗，CT 也用于对喉部损伤进行分级（谢弗分级系统）。

**<!> 注意**

**创伤病史是做出正确鉴别诊断的关键，且损伤可能较轻微，因此高度怀疑至关重要。**

**图 86**

3 例经 CT 发现喉部创伤的不同患者。(**A**)：甲状软骨中线不稳定骨折，可见大量软组织气肿（颈部软组织内的气体，以星号标示）。(**B**)：环状软骨双侧细微、无移位骨折（箭头）。(**C**)：甲状软骨双侧骨折，左侧骨折碎片向下移位（实箭头），右侧无移位的骨折线（虚箭头）

# Congenital Lesions



## Head and Neck Imaging

**CHAPTER OUTLINE:**





## 头颈部影像学

**章节大纲：**



# 先天性病变

# / Branchial Cleft Cysts

Branchial cleft anomalies are congenital lesions resulting from persisting branchial clefts or pouches.

> see also eBook chapter on Pediatric Radiology.

**<!> ATTENTION**

As most branchial cyst anomalies are seen in **children and young adults**, the identification of a purely cystic lesion at ultrasonography, CT or MRI in the appropriate clinical context is pathognomonic.

However, in **patients > 40 years**, the differential diagnosis includes a cystic metastasis (e.g., from squamous cell carcinoma, especially HPV positive oropharyngeal cancer)

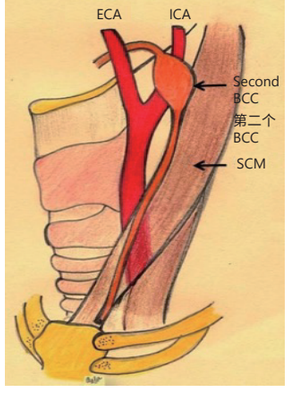



**FIGURE 88**

Schematic illustration of the anatomic location of 2nd branchial arch anomalies. Drawing courtesy: Bela Purohit, MD, National Neuroscience Institute, Singapore.

Branchial cleft anomalies comprise **cysts, fistulae or sinuses**. Cysts are the most common branchial cleft anomalies, and second branchial cleft cysts are the most common of all (>90%).

**Second branchial cleft cysts (Fig. 87)** can occur anywhere along the course of the second branchial arch (tonsills, parapharyngeal space, between the internal and external carotid arteries, along the anterior border of the sternocleidomastoid muscle, and skin opening). The most common location is posteriorly to the submandibular gland below the mandibular angle (**Fig. 88**).


**FIGURE 87**

Well-circumscribed cystic lesion with low attenuation values and thin walls on axial (a) and coronal reconstructed images (b) from a CECT (arrows) in typical location for a 2nd branchial arch cyst. Submandibular gland (SMG). Sternocleidomastoid muscle (*).



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 鳃裂囊肿

鳃裂畸形是先天性病变，源于永存鳃裂或鳃囊。

> 另请参阅《儿科放射学》电子书章节。

鳃裂畸形包括**囊肿、瘘管或窦道**。囊肿是最常见的鳃裂畸形，而第二鳃裂囊肿在所有鳃裂囊肿中最为常见（占比 >90%）。

**第二鳃裂囊肿**（图 87）可发生于第二鳃弓走行的任何部位（扁桃体、咽旁间隙、颈内动脉与颈外动脉之间、胸锁乳突肌前缘、以及皮肤开口处）。最常见的位置是下颌角下方、下颌下腺的后方（图 88）。

**<!> 注意**

**由于大多数鳃裂囊肿见于儿童和年轻人，在合适的临床背景下，US、CT 或 MRI 显示单纯囊性病变，具有特征性诊断意义（即病理特异性）。**

**然而，在 40 岁以上患者中，鉴别诊断需考虑囊性转移瘤（如来自鳞状细胞癌，尤其是人乳头瘤病毒 (HPV) 阳性的口咽癌）**

**图 87**

采用 CECT 重组的轴位 (a) 和冠状位重组图像 (b) 显示位于第二鳃弓囊肿的典型部位的边界清晰的囊性病变，CT 值低、囊壁薄（箭头）。下颌下腺 (SMG)。胸锁乳突肌 (*)。

**图 88**

第二鳃弓畸形的解剖位置示意图。图片来源：Bela Purohit，医学博士，新加坡国立神经科学研究院。

# / Thyroglossal Duct Cysts

Thyroglossal duct cyst (TGDC) is a cystic remnant of the embryologic thyroglossal duct (**Figs. 89-90**). It is the most common type of congenital neck cyst and pediatric neck mass. TGDCs typically present as midline neck masses in young patients (characteristically < 10 years of age). Patients tend to present with recurrent, intermittent swelling, usually following an upper respiratory tract infection.

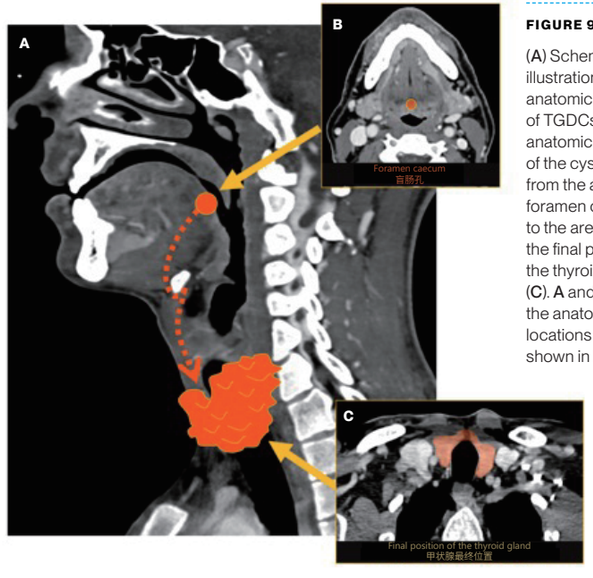



**FIGURE 90**

(**A**) Schematic illustration of the anatomic location of TGDCs. The anatomic position of the cyst extends from the area of the foramen caecum (**B**) to the area around the final position of the thyroid gland (**C**). **A** and **B** indicate the anatomic locations of the TGC shown in **Fig. 90**.

**<!> ATTENTION**

If there is a rapidly enlarging mass, think of infection or rarely differentiated thyroid carcinoma (<1% of cases).

**Imaging modalities**: In children, US is performed to confirm the presence of TGDC and of a normal thyroid gland. MRI is used in the context of infection or if the diagnosis is equivocal.

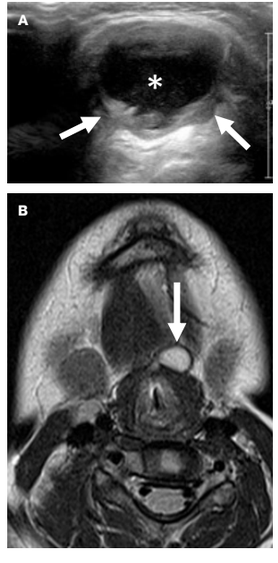



**FIGURE 89**

Two different patients with TGDCs. The patient in (**A**) had several episodes of midline neck swelling. A cystic lesion (asterisk) with thickened walls (arrows) due to recurrent infection is seen. The patient in (**B**), (T2W image) has a small, slightly offline thyroglossal cyst (arrow). The anatomic positions of the cysts in images a and b are indicated in the figure on the left as **A** and **B**, respectively.



## / Head and Neck Imaging

**CHAPTER OUTLINE:**







## / 头颈部影像学

**章节大纲：**



# / 甲状舌管囊肿

甲状舌管囊肿 (TGDC) 是胚胎期甲状舌管的囊性残余（图 89～90）。它是最常见的先天性颈部囊肿和儿童颈部肿块类型。甲状舌管囊肿 (TGDC) 通常表现为年轻患者（典型小于 10 岁）的中线颈部肿块。患者往往出现反复发作的间歇性肿胀，通常在上呼吸道感染后出现。

**<!> 注意**

**若出现快速增大的肿块，需考虑感染或罕见的分化型甲状腺癌（发生率 < 1%）。**

**影像学检查方法：对于儿童，US 用于确认 TGDC 的存在及正常甲状腺。MRI 用于感染或诊断不明确时。**

**图 89**

两名患有甲状舌管囊肿 (TGDC) 的不同患者。(A) 中的患者多次出现颈部中线肿胀。可见因反复感染导致囊壁增厚（箭头）的囊性病变（星号）。(B) 中的患者（T2W 图像）有一个小的、略偏离中线的甲状舌管囊肿（箭头）。图像 a 和 b 中囊肿的解剖部位分别对应左侧图中的 A 和 B。

**图 90**

(A) 甲状舌管囊肿 (TGDC) 解剖部位示意图。囊肿的解剖部位从盲肠孔区域 (B) 延伸至甲状腺最终位置周围的区域 (C)。A 和 B 标示甲状舌管囊肿 (TGDC) 的解剖部位（图 90）。

# / Take-Home Messages

- Head and Neck Radiology is an exciting and rewarding subspecialty of radiology.
- A thorough knowledge of the radiological anatomy is crucial to understand pathology and to formulate differential diagnoses.
- Knowledge and familiarity with all imaging modalities and their respective roles is crucial. Like other radiological specialties, radiation protection principles need to be adhered to.
- CT, MRI, ultrasonography (US) and PET CT are essential in a variety of clinical situations as they allow not only a precise diagnosis but also a detailed assessment of the anatomical location facilitating treatment planning and follow-up.
- Head and Neck radiologists work closely with ENT surgeons, oncologists, maxillo-facial surgeons, pathologists, radiation oncologists, dentists and other medical and para-medical specialties.
- Head and neck radiologists are pivotal within multidisciplinary teams and play an important role in the holistic management of benign and malignant ENT conditions.





CHAPTER OUTLINE:









章节大纲：



# / 核心要点

- 头颈部放射学是一个既令人兴奋又有价值的放射学亚专科。
- 完全掌握影像解剖学知识对于理解病理改变和进行鉴别诊断至关重要。
- 了解并熟悉所有影像学检查方法及其各自作用至关重要。与其他放射学专科一样，需遵循辐射防护原则。
- CT、MRI、US 和 PET/CT 在多种临床场景中必不可少，因为它们不仅能实现精准诊断，还可对解剖部位进行详细评估，方便进行治疗规划和随访。
- 头颈部放射科医生与耳鼻喉外科医生、肿瘤科医生、颌面外科医生、病理医生、放射治疗科医生、牙医以及其他医学和辅助医学专科密切合作。
- 头颈部放射科医生在多学科团队中至关重要，在耳鼻喉科良恶性病变的整体管理中发挥着重要作用。

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## Head and Neck Imaging

**CHAPTER OUTLINE:**







## 头颈部影像学

**章节大纲：**



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# Test Your Knowledge



## Head and Neck Imaging

**CHAPTER OUTLINE:**





## 头颈部影像学

**章节大纲：**



# 知识测试

# / Test Your Knowledge

<?> QUESTION

1 The ostiomeatal complex is a critical anatomical region in the paranasal sinuses which drains the:

- ☐ Frontal sinus
- ☐ Sphenoid sinus
- ☐ Posterior ethmoid sinus
- ☐ Anterior ethmoid air cells

(multiple answers can be correct)



CHAPTER OUTLINE:







# / 知识测试

章节大纲：



<?> 问题

1 窦口鼻道复合体是鼻窦中一个关键的解剖区域，引流以下哪些结构的分泌物：

- ☐ 额窦
- ☐ 蝶窦
- ☐ 后组筛窦
- ☐ 前组筛窦气房

（可多选）

# / Test Your Knowledge

<?> ANSWER

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CHAPTER OUTLINE:







章节大纲：



# / 知识测试

<?> 回答

1 窦口鼻道复合体是鼻窦中一个关键的解剖区域，引流以下哪些结构的分泌物：

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- ☐ 后组筛窦
- ■ 前组筛窦气房

# / Test Your Knowledge

<?> QUESTION

## 2 Regarding salivary gland tumours, which of the following is correct?:

- ☐ Most neoplasms within the parotid gland are malignant
- ☐ Pleomorphic adenoma is mostly found within the submandibular glands
- ☐ Facial palsy is invariably present in parotid pleomorphic adenoma
- ☐ Tumours of the sublingual glands are mostly malignant



CHAPTER OUTLINE:







章节大纲：





# / 知识测试

<?> 问题

## 2 关于涎腺肿瘤，下列哪一项是正确的？

- ☐ 大多数腮腺内肿瘤为恶性
- ☐ 多形性腺瘤多见于下颌下腺
- ☐ 腮腺多形性腺瘤均会出现面瘫
- ☐ 舌下腺肿瘤大多为恶性

# / Test Your Knowledge

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# / 知识测试

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- ■ 舌下腺肿瘤大多为恶性

# / Test Your Knowledge

<?> QUESTION

## 3 With respect to the role of a staging fully body CT in the diagnostic work-up of patients with thyroid cancer:

- ☐ Is indicated in all thyroid cancer cases irrespective of tumour size
- ☐ Is not indicated in assessment of anaplastic thyroid cancer
- ☐ Is indicated in cases of advanced follicular thyroid cancer
- ☐ Has a sensitivity and specificity comparable to US for assessment of discrete malignant thyroid nodules













# / 知识测试

<?> 问题

## 3 关于分期全身 CT 在甲状腺癌患者分期诊断检查中的作用：

- ☐ 无论肿瘤大小，适用于所有甲状腺癌病例
- ☐ 不适用于评估间变性甲状腺癌
- ☐ 适用于晚期甲状腺滤泡癌病例
- ☐ 在评估孤立性恶性甲状腺结节时，其敏感性和特异性与 US 相当

# / Test Your Knowledge

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CHAPTER OUTLINE:







章节大纲：



# / 知识测试

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# Test Your Knowledge

<?> QUESTION

## 4 Regarding imaging of lipomas:

- ☐ US should be integrated with CT or MRI to allow more accurate assessment
- ☐ May demonstrate internal vascularity at US during Doppler assessment
- ☐ Accurate anatomical delineation of lipomas can be adequately achieved with US even when large
- ☐ Solid or enhancing components at CT or MRI suggest a liposarcoma

(multiple answers can be correct)



CHAPTER OUTLINE:







# 知识测试

章节大纲：



<?> 问题

## 4 关于脂肪瘤的成像：

- ☐ US 应与 CT 或 MRI 相结合，以便进行更准确的评估
- ☐ 在多普勒 US 评估时，可能显示内部血管信号
- ☐ 当脂肪瘤较大时，US 也能充分准确地对其进行解剖定位
- ☐ CT 或 MRI 显示实性或强化成分，提示脂肪肉瘤

（可多选）

# / Test Your Knowledge

<?> ANSWER

## 4 Regarding imaging of lipomas:

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CHAPTER OUTLINE:









# / 知识测试

章节大纲：



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- ■ CT 或 MRI 显示实性或强化成分，提示脂肪肉瘤

# / Test Your Knowledge

<?> QUESTION

5 Which of the following anatomical levels refer to pathological lymph nodes in the posterior triangle of the neck:

- ☐ level I
- ☐ level II
- ☐ level V
- ☐ level VI





CHAPTER OUTLINE:









# / 知识测试

章节大纲：



<?> 问题

5 以下哪个解剖分区指的是颈后三角区的病理性淋巴结：

- ☐ I 区
- ☐ II 区
- ☐ V 区
- ☐ VI 区

# / Test Your Knowledge

<?> ANSWER

## 5 Which of the following anatomical levels refer to pathological lymph nodes in the posterior triangle of the neck:

- ☐ level I
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- ☐ level VI



CHAPTER OUTLINE:







章节大纲：



# / 知识测试

<?> 回答

## 5 以下哪个解剖分区指的是颈后三角区的病理性淋巴结：

- ☐ I 区
- ☐ II 区
- ■ V 区
- ☐ VI 区

# / Test Your Knowledge

<?> QUESTION

## 6 Regarding sinonasal pathology:

- ☐ In cases of acute, complicated sinusitis, CT is sufficient to exclude intracranial complications
- ☐ When dealing with sinonasal malignancy, MRI is superior to CT for tumour characterisation because of its superior contrast resolution
- ☐ CBCT and conventional CT are equally useful in the work-up of patients with chronic rhinosinusitis
- ☐ Plan radiographs are still routinely employed for the diagnosis of sinonasal pathology

(multiple answers can be correct)



CHAPTER OUTLINE:







章节大纲：





# / 知识测试

<?> 问题

## 6 关于鼻腔鼻窦病变：

- ☐ 对于急性复杂性鼻窦炎，CT 足以排除颅内并发症
- ☐ 处理鼻腔鼻窦恶性肿瘤时，由于 MRI 的对比分辨率更优，在肿瘤特征评估方面，优于 CT
- ☐ CBCT 和常规 CT 对慢性鼻-鼻窦炎患者的诊断性检查同样有用
- ☐ X 线平片仍常规用于鼻腔鼻窦病变的诊断

（可多选）

# / Test Your Knowledge

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CHAPTER OUTLINE:







章节大纲：





# / 知识测试

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- ■ CBCT 和常规 CT 对慢性鼻-鼻窦炎患者的诊断性检查同样有用
- ☐ X 线平片仍常规用于鼻腔鼻窦病变的诊断

（可多选）

# / Test Your Knowledge

<?> QUESTION

## 7 Onodi cell

- ☐ is an anterior ethmoid air cell
- ☐ is often symptomatic
- ☐ is intimately related to the carotid artery and optic nerve
- ☐ is usually associated with nasal septal deviation



CHAPTER OUTLINE:







章节大纲：



# / 知识测试

<?> 问题

## 7 Onodi 气房

- ☐ 是前组筛骨气房
- ☐ 通常有症状
- ☐ 与颈动脉和视神经密切相关
- ☐ 通常伴有鼻中隔偏曲

# / Test Your Knowledge

<?> ANSWER

## 7 Paragangliomas of the head and neck region:

- ☐ is an anterior ethmoid air cell
- ☐ is often symptomatic
- ■ is intimately related to the carotid artery and optic nerve
- ☐ is usually associated with nasal septal deviation









# / 知识测试

<?> 回答

## 7 头颈部副神经节瘤:

- ☐ 是前组筛骨气房
- ☐ 通常有症状
- ■ 与颈动脉和视神经密切相关
- ☐ 通常伴有鼻中隔偏曲

# / Test Your Knowledge

<?> QUESTION

## 8 Paragangliomas of the head and neck region:

- ☐ are mostly parasympathetic (as opposed to sympathetic)
- ☐ are generally secretory
- ☐ often display flow voids at MRI
- ☐ have a characteristic salt and pepper appearance

(multiple answers can be correct)



CHAPTER OUTLINE:







章节大纲：



# / 知识测试

<?> 问题

## 8 头颈部副神经节瘤：

- ☐ 多为副交感神经来源（而非交感神经来源）
- ☐ 通常具有分泌功能
- ☐ MRI 常显示血管流空信号
- ☐ 具有特征性的“椒盐征”

（可多选）

# / Test Your Knowledge

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CHAPTER OUTLINE:







# / 知识测试



章节大纲：



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- ■ 具有特征性的“椒盐征”

# / Test Your Knowledge

<?> QUESTION

9

## Regarding thyroglosal duct cysts:

- ☐ They are rare congenital neck cysts
- ☐ Typically present in adulthood
- ☐ Are typically located in the midline
- ☐ The majority are located in the foramen caecum



CHAPTER OUTLINE:







章节大纲：





# / 知识测试

<?> 问题

9

## 关于甲状舌管囊肿：

- ☐ 是罕见的先天性颈部囊肿
- ☐ 通常见于成年期
- ☐ 通常位于中线
- ☐ 大多数位于盲孔

# / Test Your Knowledge

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CHAPTER OUTLINE:







章节大纲：



# / 知识测试

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- ☐ 通常见于成年期
- ■ 通常位于中线
- ☐ 大多数位于盲孔

# / Test Your Knowledge

<?> QUESTION

## 10 Regarding imaging of vestibulocochlear schwannomas:

- ☐ Vestibular schwannomas have to be evaluated with CT and MRI
- ☐ MRI is unable to distinguish the vestibulocochlear nerve from the seventh cranial nerve
- ☐ Contrast enhanced MRI is the gold standard imaging technique
- ☐ The presence of bilateral vestibulocochlear schwannomas is pathognomonic for neurofibromatosis type 1



CHAPTER OUTLINE:







# / 知识测试

章节大纲：



<?> 问题

## 10 关于前庭耳蜗神经鞘瘤的成像：

- ☐ 前庭神经鞘瘤必须用 CT 和 MRI 进行评估
- ☐ MRI 无法区分前庭蜗神经与面神经
- ☐ 增强 MRI 是影像学技术的金标准
- ☐ 双侧听神经瘤是神经纤维瘤病 2 型的特征性表现

# / Test Your Knowledge

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CHAPTER OUTLINE:







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- ☐ 双侧听神经瘤是神经纤维瘤病 2 型的特征性表现

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