

## Adenocarcinoma of the submandibular salivary glands

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**Section:** Head & neck imaging

**Area of Interest:** Liver Salivary glands Lung Bones

**Procedure:** Diagnostic procedure

**Imaging Technique:** Ultrasound

**Imaging Technique:** MR

**Imaging Technique:** CT

**Imaging Technique:** Nuclear medicine conventional

**Special Focus:** Metastases Neoplasia Case Type:

Clinical Cases

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**Patient:** 24 years, female

### Clinical History:

A 24-year-old woman came to our attention after noticing the presence of a swelling in the right side of the neck causing pain and difficulty in swallowing.

### Imaging Findings:

An MRI was performed showing an expansive solid mass at the level of the right submandibular gland (Fig. 1) with an increased size of the jugulodigastric lymph node.

The patient underwent submandibular gland excision, lymphadenectomy and radiation therapy. The first CT scan performed in follow-up identified three enlarged lymph nodes (two in the lung hilum and one subcarinal) suspicious for nodal metastases (Fig. 2).

The second CT (performed after three months) showed the presence of liver metastases (Fig. 3) confirmed by US (Fig. 4). The third CT scan (performed after six months) showed multiple osteolytic lesions at the level of spine, ribs, sternum and pelvis (Fig. 5) confirmed by total body scintigraphy (Fig. 6). The last CT showed an increasing number of metastases in the liver (Fig. 7), the presence of lymphadenopathy in the hepatic and left lung hilum, the development of further skeletal metastases.

### Discussion:

Salivary gland tumours are a very rare disease (2% human's tumours). About 65-80% are attributable to the parotid glands, 10% to the submandibular glands and the remaining percentage to minor salivary glands. Usually they occur with greater frequency in adults and occur with nearly equal frequency in men and women [1]. The aetiology and pathogenesis of human salivary gland tumours are unknown. Possible causes are: external radiation therapy to the head and neck [2], immunosuppression and EBV [3], HIV infection [4], genetics and contact with toxic materials such as rubber or nickel [5].

Adenocarcinomas of the salivary glands are aggressive tumours. Symptoms include: pain, facial weakness and swelling of the affected part. Adenocarcinoma might appear as a solid mass with irregular borders and infiltration of surrounding tissues, usually without any cystic spaces and showing glandular structures. This tumour is described as grade I, II or III based upon the degree of cellular differentiation (grade I: presence of many glandular structures, grade III: few glandular structures) [6]. Diagnosis is made by clinical history, physical examination, imaging and

histology. US is the first approach because ultrasound can recognise the presence of a focal lesion, evaluate the characteristics of this lesion or be a guide for biopsy. The accuracy, sensitivity and specificity reported in the literature for fine-needle aspiration biopsy is 84-97%, 54-95% and 86-100% respectively [7]. Moreover, this procedure is safe and well tolerated by patients. For tumour of submandibular salivary glands MRI is helpful to evaluate the extent of disease. CT, scintigraphy and PET are used for staging the disease especially to recognise metastases [8]. Carcinomas of the salivary glands might metastasise to lymph nodes, lung, bone and liver. The probability to develop distant metastases varies with histology.

The treatment consists in surgical excision [9] and post-operative radiotherapy in selected patients [10].

**Differential Diagnosis List:** Adenocarcinoma of the submandibular salivary glands, Lithiasis of the submandibular gland, Inflammation of the submandibular gland, Mandibular tumour, Tumour of the floor of the mouth

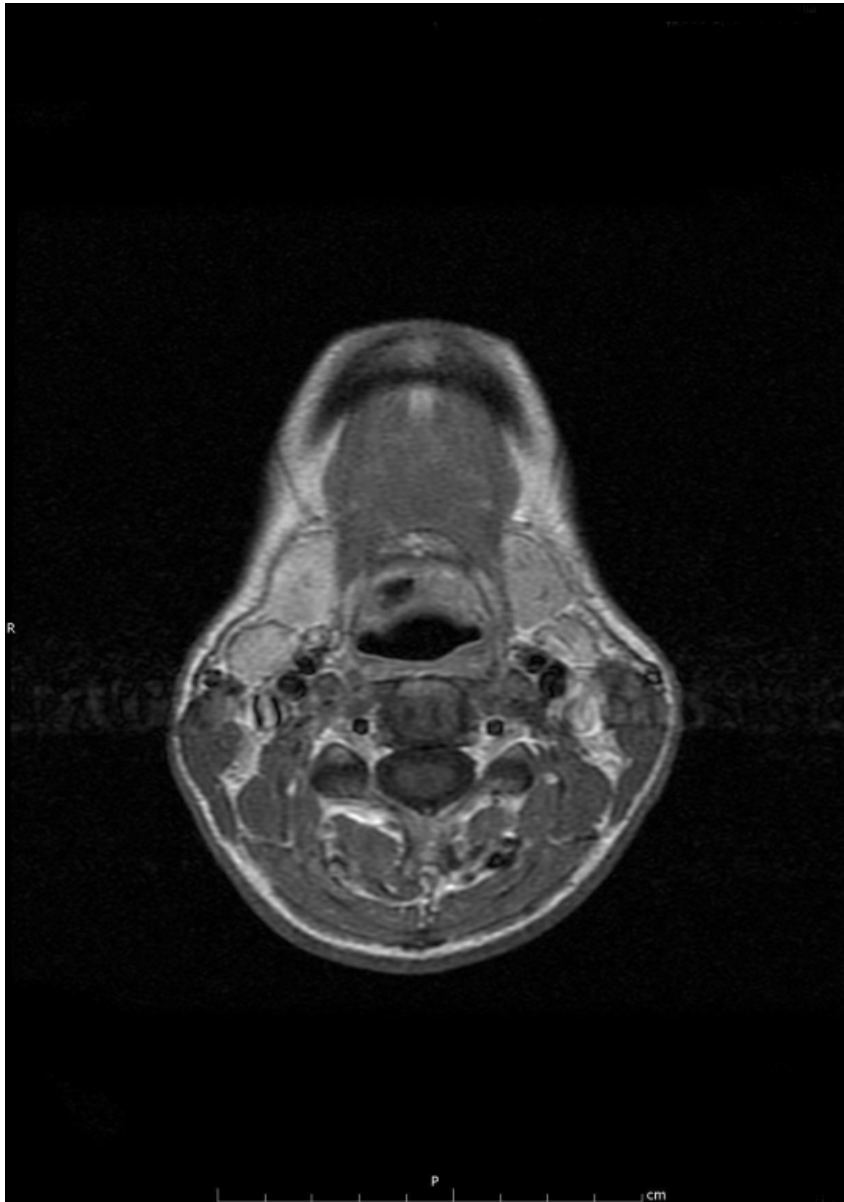
**Final Diagnosis:** Adenocarcinoma of the submandibular salivary glands

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**Figure 1**

a



**Description:** MRI (axial T2 wi): evident expansive solid mass (maximum diameter: 14mm) with smooth margins and partial exophytic development at the dorsal side of the right submandibular gland. **Origin:** Department of Radiology, AOUP, Pisa, Italy

**b**



**Description:** MRI coronal T2 wi  
with fat supression **Origin:** Departmet of Radiology, AOUP, Pisa, Italy

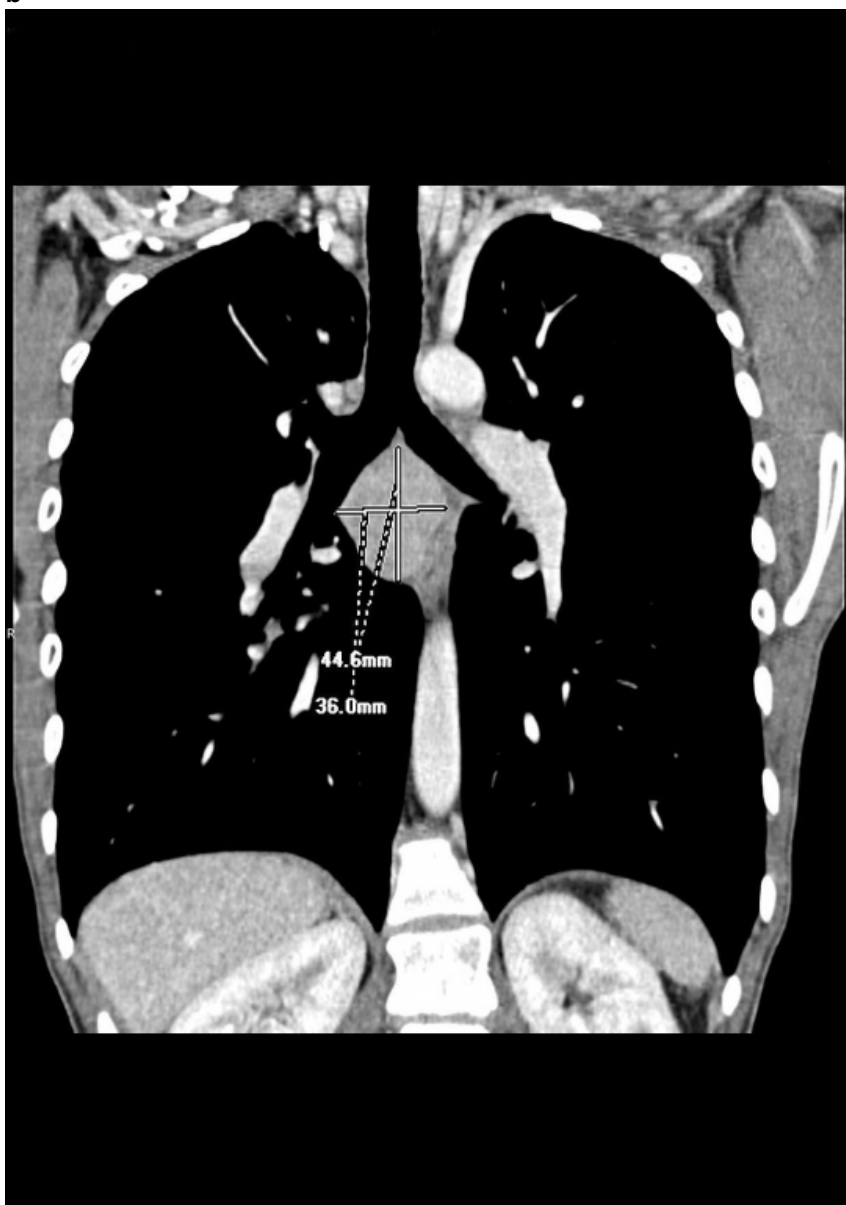
**Figure 2**

a



**Description:** First CT examination posttreatment shows the presence of two lymph nodes in the left hilum (size: 20x18mm and 16x11mm). **Origin:** Department of Radiology, AOUP, Pisa, Italy

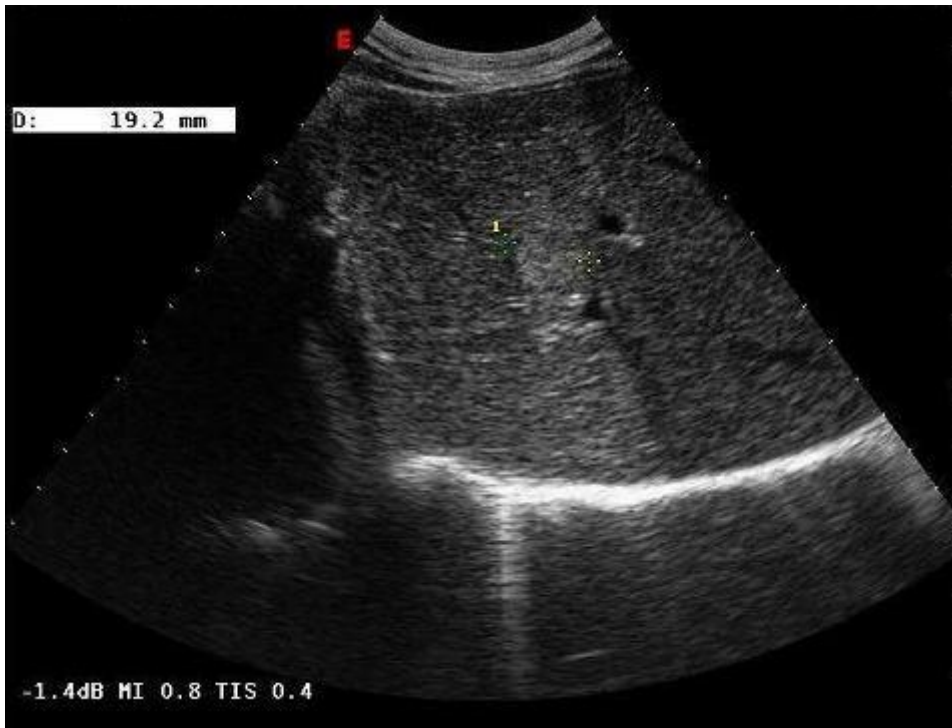
**b**



**Description:** First CT examination post treatment (coronal view) shows presence of lymph nodes in subcarinal region (size: 26x36x51mm). **Origin:** Department of Radiology, AOUP, Pisa, Italy

**Figure 3**

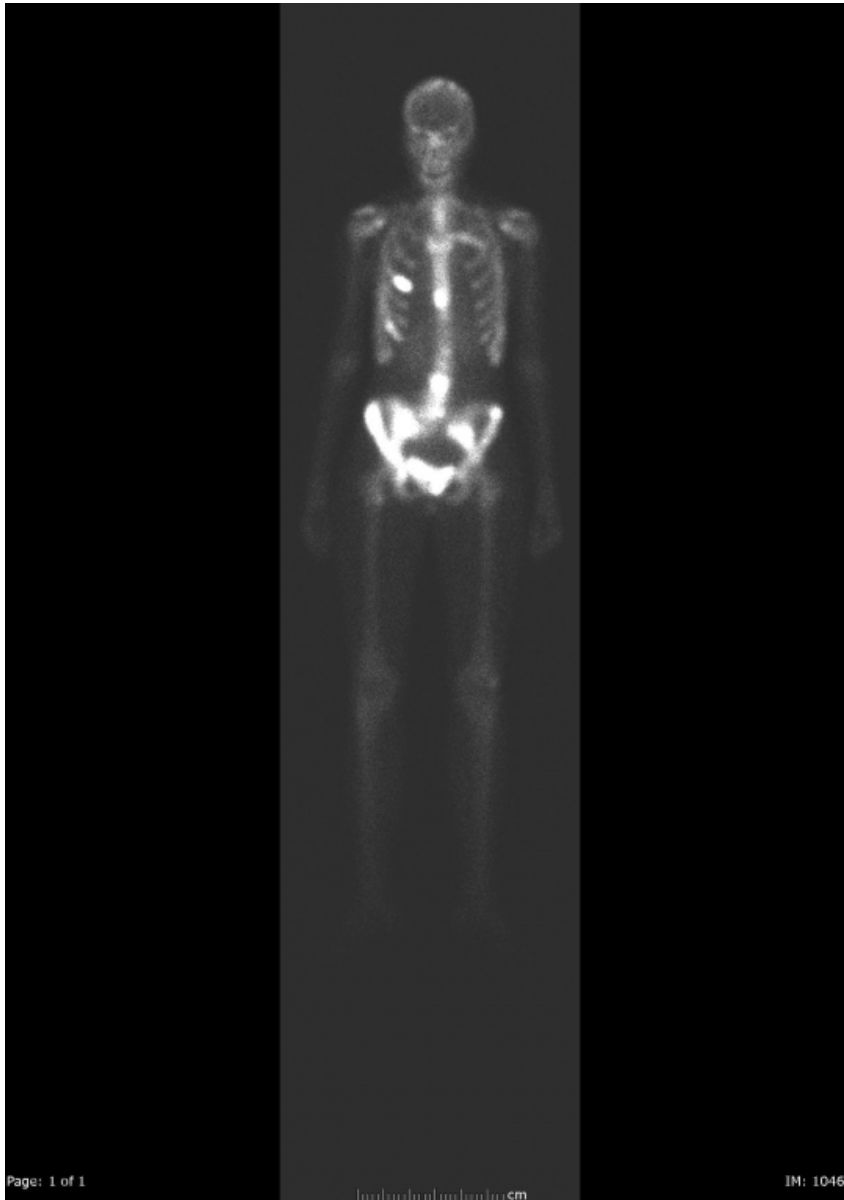
a



**Description:** US: presence of an hyperechoic metastatic lesion in the liver (maximum diameter: 19 mm). **Origin:** Department of Radiology, AOUP, Pisa, Italy

**Figure 4**

a



**Description:** Total body scintigraphy: multiple areas of increased uptake of multiple areas of the radiopharmaceutical. **Origin:** Department of nuclear medicine, AOUP, Pisa, Italy



**Figure 5**

a



**Description:** Second CT examination (after 3m) shows presence of hypodense metastatic lesion in the liver. **Origin:** Department of Radiology, AOUP, Pisa, Italy

**Figure 6**

a



**Description:** Last CT examination shows increase in the number and size of liver metastases. **Origin:** Department of Radiology, AOUP, Pisa, Italy

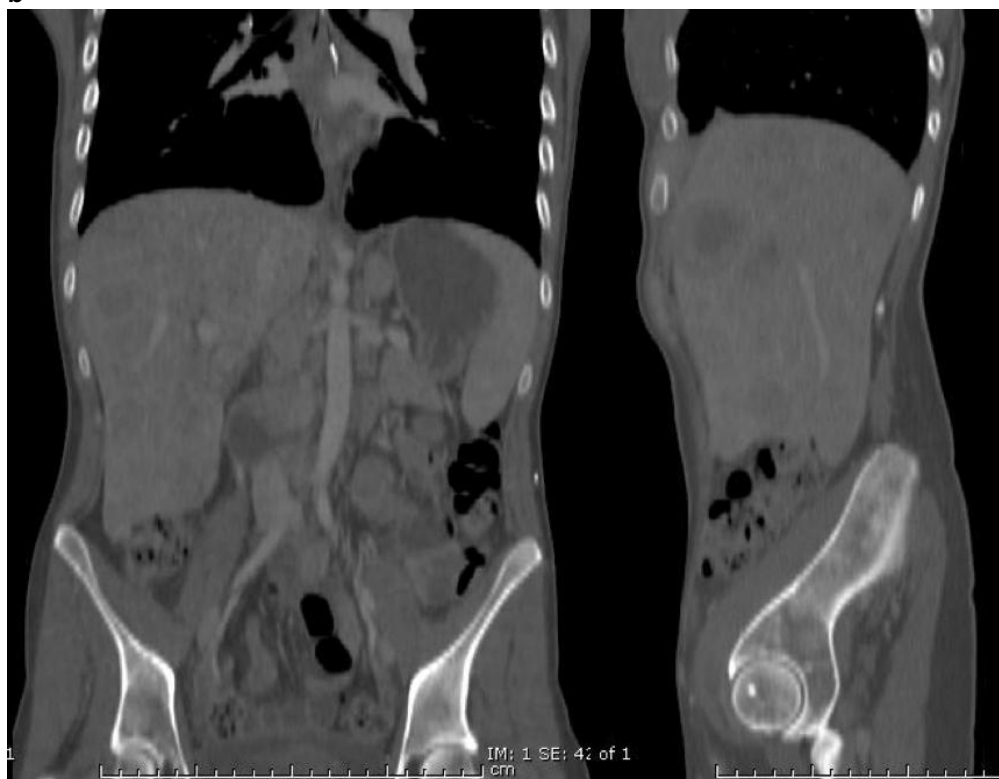
**Figure 7**

a



**Description:** Third CT examination (after 6m): metastatic lesions of the spine and sternum. **Origin:** Department of Radiology, AOUP, Pisa, Italy

**b**



**Description:** CT scan shows osteolytic lesions of the ileum and metastatic lesion of the liver. **Origin:** Department of Radiology, AOUP, Pisa, Italy