The parapharyngeal adipose corpus: morphologic study

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Summary: The parapharyngeal adipose corpus is a well limited adipose structure lying deep in the prestylian space, close to the lateral wall of the upper part of the pharynx. Macroscopic and microscopic anatomic sections were made and compared with CT and MR sectional imaging. The walls and contents of the parapharyngeal adipose corpus are described on the basis of anatomic sections and are symmetrically visualized by sectional imaging in the axial and coronal planes. A knowledge of its relations explains its role in imaging as an early marker of invasive tumoral processes. It is in continuity with the upper part of the buccal fat pad and presents the same functional characteristics of a gliding structure.

The parapharyngeal adipose corpus (PAC) is a well limited adipose structure located deep within the face, in the deep part of the prestylian space. Visualisation of the PAC is possible due to recent advances made in CT and MR imaging. Such imaging allows the clinical and functional relevance of the PAC, as well as the development of routes for surgical access, a reality. However, the morphology of the PAC has not been systematically investigated, consequently the aim of the present study is to determine the morphology of the PAC.

A description of the PAC precedes that of its morphology and relations. Histological examination of the PAC analyzes the characteristics of its adipose tissue, as well as showing its juxtaposition with the upper part of corpus adiposum buccae (CAB). In the newborn, histological examination allows the recognition of differences in maturation of these two neighbouring accumulations of adipose tissue.

A clear understanding and knowledge of the morphology of the PAC is important for radiologists, since the PAC is an early adipose marker of invasive tumours in imaging.

Material and methods

The morphologic study of the PAC was undertaken using anatomic and histologic sections and compared with CT and MR images taken in the coronal and axial planes. Anatomic sections were made using cadaveric material, in the three cardinal planes. Frozen heads were cut in slices 9 mm thick. Six heads were studied: two in the frontal plane, two in the sagittal plane and two in the transverse plane.

The histologic study of the PAC was performed on two heads: one of a seven months old fetus, the other of a dead newborn. The fetal head was examined in the axial plane, while that of the newborn was examined in the coronal plane. The 15 micron thick sections were stained with trichrome and with haema-
toxylin and eosin. The resulting slides were examined using a magnifying glass and light microscope; they were then photographed by an Aristophot (Leitz) (Figs. 1, 2).

**Results**

**Anatomical description**

The parapharyngeal adipose corpus (PAC) lies in the deep anterior part of the prestylian space. It is situated in the maxillo-pharyngeal space, paratonsillar or Sebileau's anterior subparotideal space better known as the parapharyngeal adipose space (Figs. 1 and 2).

**Walls of the parapharyngeal adipose space**

The parapharyngeal adipose space is a triangular prism, with an anterior ridge. It is narrow at its upper part and enlarges towards its inferior base.

Three walls and two extremities can be described.

1. The upper extremity is basicranial. Posteriorly it lies at the junction of the medial extremity of the tympanic part of the temporal bone with the horizontal part of the greater wing of the sphenoid, boarding the petrous part of the temporal bone. Anteriorly, it lies at the junction of the peripharyngeal fascia with the interpterygoid fascia, medial to the foramen spinosum.

2. The lower extremity or base is virtual because it is in continuity with the adipose tissue of the submandibular space. It is situated at the level of a horizontal plane passing in the middle of a line joining the angle to the retroalveolar fossa of the mandible.

   The lower extremity is bounded laterally by loose cellular tissue. Medially it communicates with the submandibular space by an opening limited laterally by the medial pterygoid and medially by the styloglossus and superior constrictor of the pharynx (Figs. 3 and 4).

3. The posterior wall at the level C 1 comprises the stylopharyngeus muscle and the stylopharyngeal fascia which unites.

**Fig. 1** Coronal section through the ramus of the mandible. 1: parapharyngeal adipose corpus (PAC); 2: internal carotid a. in the cavernous sinus; 3: disc of the temporomandibular joint; 4: Auditory tube; 5: superior constrictor of the pharynx; 6: lateral pterygoid; 7: medial pterygoid; 8: masseter; 9: maxillary a.

**Fig. 2** Axial section through the median part of the infratemporal fossa. 1: PAC; 2: corpus adiposum buccae (CAB); 3: medial pterygoid; 4: lateral pterygoid; 5: masseter; 6: prevertebral muscles; 7: internal carotid a. in the retrostylian space; 8: stylian apparatus; 9: deep extension of the parotid gland; 10: pharynx

**Fig. 3** Axial histologic section through the top of the odontoid process of the axis (fetus, 6 months). Left side. 1: PAC; 2: retrostylian space with the internal carotid a.; 3: mandibular ramus; 4: masseter; 5: medial pterygoid; 6: styloglossus; 7: deep extension of the parotid gland; 8: submandibular gland