

## Original Paper

# Transoral Approach of the Parapharyngeal Tumors

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### REZUMAT

#### *Abordul transoral al tumorilor parafaringiene*

Tumorile spațiului parafaringian sunt rare, de natură histologică variată. Alegerea atitudinii terapeutice în cazul acestor tumori ridică dificultăți. Autorii evaluează tipuri variate de abord chirurgical al tumorilor localizate în spațiul parafaringian, luând în considerare date clinice și paraclinice de evaluare preoperatorie. Se examinează beneficiile utilizării abordului chirurgical transoral al acestor tumori.

**Cuvinte cheie:** spațiu parafaringian, abord chirurgical, transoral

### ABSTRACT

Parapharyngeal space tumors are rare, of diverse histological nature. The choice of these tumors' therapeutic approach raises difficulties. The authors evaluate various forms of surgical approach of tumors located in the parapharyngeal space considering matters of clinical and laboratory preoperative evaluation. It examines the benefits of using transoral surgical approach for these tumors.

**Key words:** parapharyngeal space, surgical approach, transoral

### INTRODUCTION

Parapharyngeal space has the shape of a reversed pyramid with the base at the cranial surface delimited by temporal and sphenoid bone and the top pointing to the large horn of the hyoid bone.[1] Styloid diaphragm divides the parapharyngeal space into two regions with different anatomy and constituents: prestyloid space, anterior, containing the deep lobe of the parotid gland, internal maxillary artery, inferior alveolar nerve, lingual, auriculo-temporal, and retrostyloid space, posterior, neurovascular, that contains the internal carotid artery, internal jugular vein, cranial nerves glossopharyngeal, vagus, accessory, hypoglossal and cervical sympathetic

chain. [2] Tumors arising in parapharyngeal space are rare, representing less than 1% of all head and neck malignancies. Any of the structures contained in this space can be a starting point for developing a tumor masses at this level. Most of these tumors are benign, approximately 20% are malignant. [1] The most common tumors of the salivary gland tissue derived from space and are epithelial in nature. Others are likely neurogenic, vascular, lymphatic, etc. [3]

### MATERIAL AND METHODS

We analysed multiple cases of parapharyngeal space tumors, of various sizes, with variable expression in the

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oropharynx. Patients are diagnosed based on clinical and paraclinical investigations, using CT with or without contrast, MRI, angiography with contrast, histopathology. Patient follow-up after a month after surgery is conducted.

### Clinical diagnosis

In most cases, symptomatic patients present large tumoral masses in the parapharyngeal area. In rare cases, when small tumors are involved, symptoms include neuralgic syndromes, headache, paresthesias and paralysis of cranial nerves.

When parapharyngeal tumors grow, they can cause various symptoms, progressive dull aching pain in the throat, foreign body sensation in the oropharyngeal area, difficulty swallowing or breathing, due to diffuse swelling of the tonsillar fossa, uvula deviation, gradual facial asymmetry. [4]

### Endoscopy

Parapharyngeal space tumors determine an impression on the pharyngeal lateral wall bulging in the pharyngeal cavity. The tumoral mass can be evaluated using endoscopic viewing both trans-nasally and trans-orally. [5,6] (Fig. 1, 2)

### Imaging examination

Imaging Studies should be performed before biopsy of a parapharyngeal space tumor, because they can help with differential diagnosis of the mass. In some cases imagistic exams may strongly suggest diagnosis without the need for fine-needle aspiration biopsy (FNAB) or open biopsy. The origin of the tumor in the prestyloid or retrostyloid space is determined.

The usual imaging studies used to evaluate parapharyngeal space tumors are computer tomography (CT) scanning and magnetic resonance imaging (MRI). These exams are used as starting point in the evaluation of a parapharyngeal space. Angiography also is useful for enhancing lesions and evaluating tumoral blood flow. [7]

CT scanning can determine the origin of a parapharyngeal space mass in the prestyloid or poststyloid space and its relation with deep lobe of the parotid. Fat found between the parotid and the mass suggests an extraparotid origin. CT scan demonstrates the presence of calcifications and bony involvement and associated with contrast infusion this exam appreciate the anatomic relationship between the tumor and the great vessels. As most parapharyngeal space masses are prestyloid lesions are arising from the parotid gland, CT scanning may be the only examination needed for diagnosis. (Fig. 3, 4, 5)

Magnetic resonance imaging evaluates the soft tissue characteristics of parapharyngeal space tumors, differentiates between tumor and muscle, and it has greater resolution in defining the great vessels and their relationship to tumor. Also intracranial extension is evaluated using

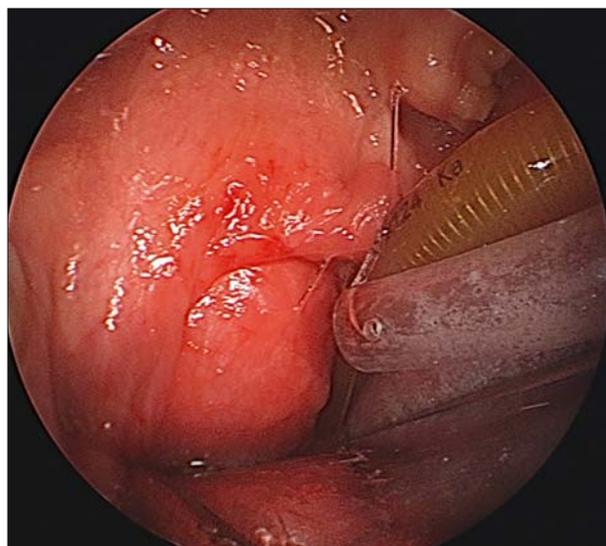


Figure 1. Transoral endoscopic view of right retrostyloid parapharyngeal space tumor



Figure 2. Transnasal endoscopic view of retrostyloid parapharyngeal space tumor situated posteriorly of Eustachian tube

MRI. CT scanning and MRI reveal complementary diagnosis information used in the evaluation of extensive lesions or when malignancy is suspected. [7]

Angiography is useful in analyzing vascular lesions, when malignancy is suspected and if carotid sacrifice is possible during resection. In some cases angiography evaluates the relationship to the great vessels to the tumoral mass and help differential diagnosis between neurogenic lesions. CT angiography and magnetic resonance (MR) angiography also may be used.[8]

### Biopsy

Although in most cases diagnosis is suggested by



**Figure 3.** CT image of parapharyngeal space tumoral mass - solitary fibrous tumor (coronal view)

imaging examination, biopsy of a parapharyngeal space mass may be performed after imaging results.

Fine needle aspiration biopsy (FNAB), with or without radiologic guidance, may be performed, transcervically or transorally.

Incisional biopsy is considered on non-operative cases and when malignancy or lymphoma is strongly suspected. Usually, complete surgical excision is recommended for both diagnostic and therapeutic purposes.

Surgery of parapharyngeal space tumors raise particular difficulties due both to regional richness in vital elements, and because the anatomy of the area. Parapharyngeal space is located profoundly, hidden in the depth of the upper cranial cervical region, protected by bony structures and muscles.

The choice of surgical approach of this area involves the analysis of preoperative regional tumoral data: histological benign or malignant nature, tumor vasculature or important vascular elements that are found on this level (internal jugular vein, internal carotid artery), location, tumor size, functional considerations. [9]

## DISCUSSIONS

Common types of surgical approach of parapharyngeal space are transcervical approach with / without digastric muscle section with or without resection of the submandibular gland, transcervical approach with / without mandibulotomy and trans-oral approach with / without mandibulotomy. Also are used transparotidian approach and infratemporal approach of parapharyngeal space tumors.

Transcervical approach is the most common method for removal of most poststyloid parapharyngeal space tumors. A transverse incision at the level of the hyoid bone is use to acces the vascular fossa. Dissection reveals



**Figure 4.** CT image of parapharyngeal space solitary fibrous tumor located in the retrostylian region with retropharyngeal extension (transverse view)



**Figure 5.** CT image of parapharyngeal space tumoral mass (sagittal view)

the digastric and stylohyoid muscles. For access to the parapharyngeal space the muscles are retracted or sectioned. Also the submandibular gland can be retracted anteriorly for exposure, or it can be removed if necessary.

Transparotid approach is usually used for tumors originating in the deep lobe of the parotid. Carefull dissection of the facial nerve is required and superficial parotidectomy is performed.

Transcervical approach associated with lateral or anterior mandibulotomy may be appropriate in cases when better exposure is required, such as cases of large tumors, vascular tumors with superior parapharyngeals pace extension in which distal control of the carotid at the skull base is required, malignancies in which better exposure facilitates oncologic resection.

Tracheostomy may be required in the immediate postoperative period.

### Transoral approach

The transoral approach has been described for the removal of small, benign tumors that originate in the prestyloid parapharyngeal space and manifest as an oropharyngeal mass. The the limitations of this approach are limited exposure, inability to visualize the great vessels, and an increased risk of facial nerve injury and tumor rupture. [10]

Although this approach is classically indicated for small, benign salivary tumors arising from minor salivary glands of the lateral pharyngeal wall, some cases of very large masses were treated using trans-oral approach.

Surgery is performed under general anaesthesia with orotracheal intubation.

An autostatic retractor of the mouth is used to reveal the oropharynx and proccident intrapharyngian tumor mass. For a better examination of the tumor, soft palate is elevated using a Nelaton probe.

The evaluation of tumor size and extension in the pharynx is performed using endoscopic techniques: trans-nasal endoscopy (for the evaluation of the extension to the rear wall of the nasopharynx) using a optical rod at 0 degrees, combined with transoral endoscopy using optical rod of 70 degrees to evaluate the tumoral impression, retrogradely, for nasopharynx and direct for hypopharyngeal region, and a 0 degrees rod for oropharynx. [11, 12]

An endoscope of 0 degrees is introduced throughout the nasal fossa untill the nasopharynx can be observed. Abnormality is detected by endoscopy in terms of lumen nasal, superior extension of the tumor mass in the nasopharynx, bulging internal nasopharyngeal wall, the effect on breathing space and Eustachian tube. Intra-operative endoscopy verifies the anatomic changes after tumor excision.

Also the endoscope is inserted in the open mouth, inspecting the tumoral mass occupying the oropharyngeal space. It's extension superiorly through the nasopharynx and inferiorly in the hypopharynx, causing respiratory and swallowing space reduction is inspected using a 70 degrees endoscope.

Transoral or bimanual palpation of the tumor mass provide additional data concerning the consistency of the tumor, adherence, mobility on the underlying plans. [13]

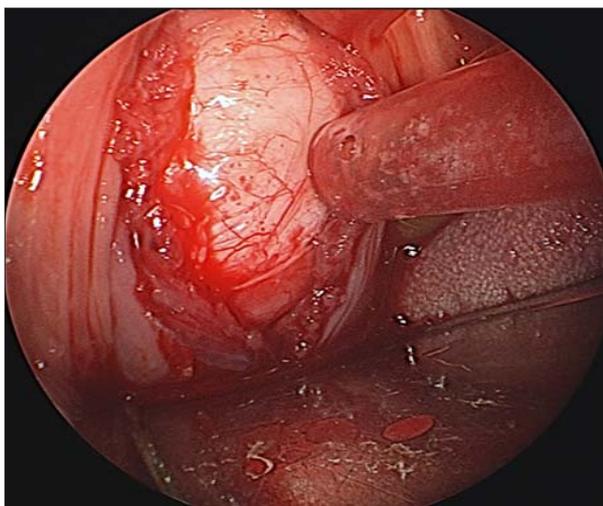
The incision using a scalpel or radiofrequency needle is performed at the maximum tumoral bulging in the throat, frequently retrotonsillar. Blunt dissection of the tumoral mass is achieved. (Fig. 6-9)

Using this method, complete tumor ablation is possible, respecting the tumoral capsule. Bleeding throughout the procedure was minimal. After local hemostasis maneuvers, musculo-mucosal pharyngeal reconstruction is performed, transorally, with separate silk threads. (Fig. 10)

This technique is more easily accepted by the patient, offers a wide enough operatory field for the safe and com-

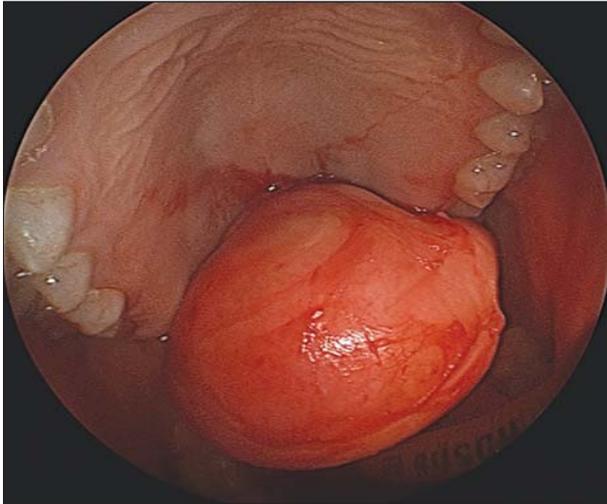


**Figure 6.** Endoscopic view of transoral pharyngeal mucosa incision that reveals pharyngeal constrictor muscle pushed by tumoral mass medially

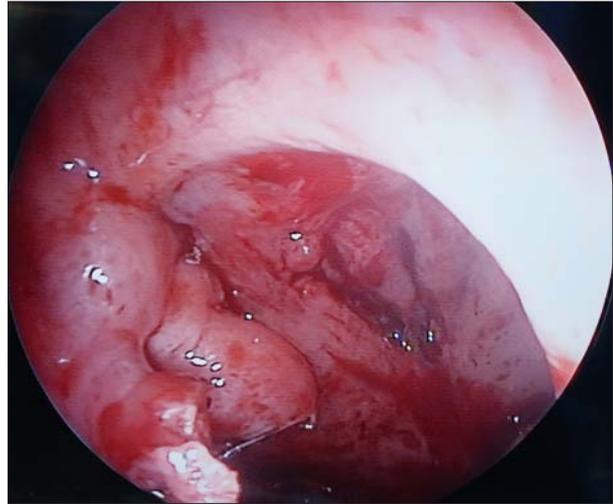


**Figure 7.** Huge, well determined, encapsulated tumoral mass (solitary fibrous tumor) arising in the operative field after pharyngeal constrictor muscle incision. Transoral endoscopic view

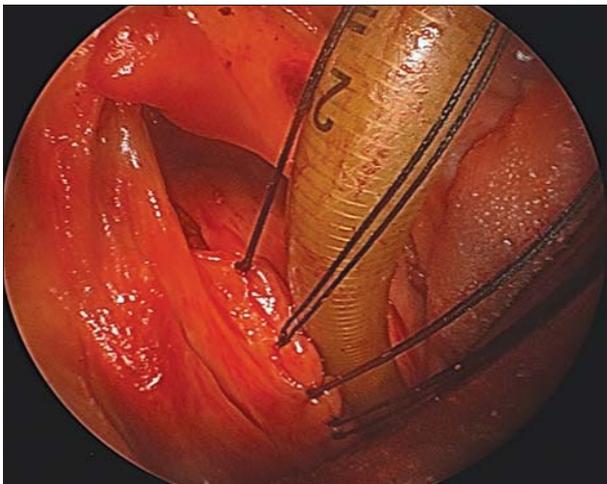
plete excision of a large tumor mass, which is well defined and has a benign character. The risk of intraoperative complications does not outweigh the risks associated with other ways to address these situations. Usually the patient's respiratory evolution does not lead to the need for tracheotomy. Swallowing may be resumed the day after surgery, with no need for nasogastric tube. . The advantages of transoral approach include the absence of cervical scar, of mandibular osteotomies, avoiding facial nerve lesion, the diminished risk of fistulas and wound infection. The transoral approach may be combined with an external approach in order to access lesions with significant involvement of the oropharynx. [14]



**Figure 8.** After careful blunt dissection, a well defined, encapsulated, parapharyngeal space mass is completely ablated by transoral approach



**Figure 9.** Endoscopic nasal control after tumor transoral excision



**Figure 10.** Reconstruction of musculo-mucosal layer. Endoscopic view

### CONCLUSIONS

Large, well defined tumors, located in the parapharyngeal space, presenting clinical and paraclinical features suggestive for benign character, located in the prestyloid or retrostyloid region, can be addressed transorally. Transoral surgery of these tumors can be achieved with maximum benefit in terms of both complete excision of the tumor mass with minimal postoperative consequences and esthetic comfort.

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