

# Surgical Resection of a Parotid Gland Hemangioma in Teenager Managed with External Carotid Artery Ligation

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## Abstract

Parotid gland hemangiomas represent <0.6% of the total tumors of the gland and there are <50 tumors reported during adult age, so there is no standard treatment. A 18-year-old female presents with a mass in the right parotid gland of 18 months of a slow progressive asymptomatic growth; on physical examination, only the mass was detected. An angiography was performed, and it reported a possible hemangioma that depends on the right internal maxillary artery and right facial artery and was not suitable for embolization. Total parotidectomy was performed with prior ligation of the right external carotid artery, complete resection was achieved and preservation of the facial nerve and all branches with minimal loss of blood (150 cc). External carotid artery ligation is a safe technique that can be considered in carefully selected patients with vascular tumors that affect the head and neck to achieve a clean and safe surgery with minimal sequels.

**Keywords:** Adults, external carotid ligation, parotid gland hemangioma

## INTRODUCTION

Parotid gland hemangiomas represent 0.4%–0.6% of the tumors that affect this gland and most of them appear in the newborn population,<sup>[1]</sup> making them the most common tumors in the gland affecting 4%–10% of all the infants and 23% of the premature ones. One-third presents itself at birth and the rest in the 1<sup>st</sup> year.<sup>[2]</sup> However, most of the hemangiomas grow during the first 6–8 months following involution during the first decade of life.<sup>[3]</sup> The vast majority of them are asymptomatic and typically followed clinically.<sup>[4]</sup> In contrast, there are <50 cases reported in the adult population,<sup>[1]</sup> and cavernous hemangiomas in adults do not tend to regress;<sup>[5]</sup> moreover, the diagnosis is challenging since this diagnosis is not suspected as a main possibility.

Most treatment algorithms consider the surgery a last resort,<sup>[2,4]</sup> but it is proposed for the pediatric population, because most patients will only need observation and a few can be treated medically. Nevertheless, in an adult, the probability of an oncologic diagnosis is more common, and in most of the other diagnosis of parotid gland tumors, surgery is the treatment of choice.

## CASE REPORT

A 18-year-old female with no personal or family history of interest had a right parotid mass with slow progressive growth over the past 18 months, and initially, it was asymptomatic. On physical examination, a soft, elastic, painless, fluctuating and nonpulsatile mass without trophic skin changes with 4 cm × 4 cm of maximum diameter. Cervical lymphadenopathy or other masses were not palpable. During her initial diagnostic approach outside our hospital, a fine-needle aspiration biopsy was made, reporting only hemorrhagic content and a computed axial tomography which reports an image suggestive of an arteriovenous malformation. With these findings, an angiography for diagnosis and therapeutic purpose was performed, and a hemangioma of the parotid gland that depends

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on the right internal maxillary artery and the right facial artery was diagnosed but was not suitable for embolization attempts due to technical difficulties. The patient was prepared for surgery [Figure 1].

### Surgical procedure

The patient was led to the operation room for a parotidectomy through facelift incision; patient in dorsal decubitus, with neck hyperextension (Rosier position), neck projected preauricular incision (Lahey) is made for parotid exposure and progressive layer dissection until parotid pseudocapsule is reached. Skin flap is made for complete exposure of the gland deformed by the tumor of 4 cm long on the upper lobe and hemangioma. Dissection of platysma and anterior border of sternocleidomastoid muscle is done to identify thyrolinguofacial trunk, detecting inflammatory adenopathy overlying the internal jugular vein, posterior approach of vascular package of the neck with resection of cervical ganglia in level 2 and 3, allowing the exposition of the primitive carotid artery, continuing its dissection, exposing its bifurcation, and identification of the superior thyroid branch, and the ligation of the external carotid artery is made above this point with silk 1-0 [Figure 2]. We continued the dissection of the sternocleidomastoid muscle to mastoid process, anterior portion of auricular cartilage and bone until identification of facial nerve, following up of its zygomatic temporal and mandibular branches identifying the posterior facial vein, cut and ligature of the vascular pedicle, with harmonic scalpel, as well as Stenson's conduit. Superficial and deep lobe are extracted separately with the hemangioma at the expense of the parotid's tail. We verify hemostasis and integrity of the facial nerve and its branches. We proceeded to wash, placement of Blake drainage 10 Fr. Closure by planes, subcutaneous cellular tissue, skin, with poliglecaprone 3-0.

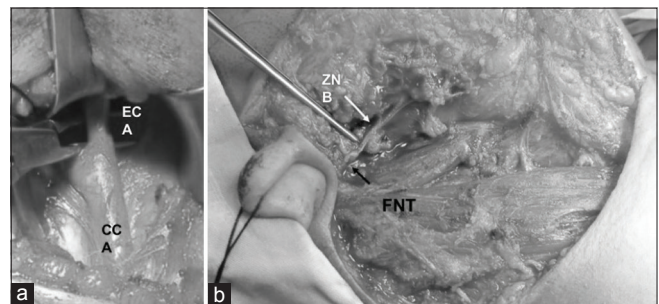
The surgery was performed in 94 min without incidents, and during the procedure, the right facial nerve and its branches were identified and preserved with a quantified bleeding of 150 ml [Figure 3], the histopathologic report was a cavernous hemangioma fully resected without neoplastic cells. At 10 months of follow-up, the patient had no symptoms of facial nerve lesion and is currently asymptomatic.

### DISCUSSION

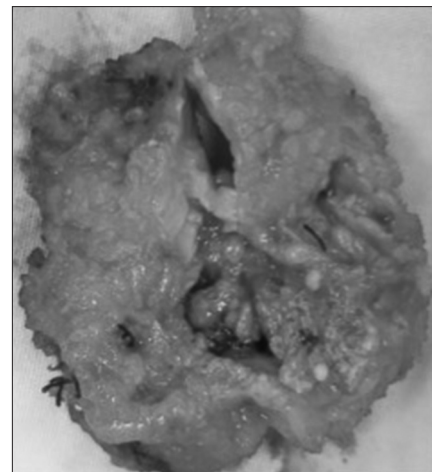
Hemangiomas represent a very small percentage of the total of the parotid gland tumors, even though they are the most common tumors in the gland in pediatric ages, but the evolution of these tumors in most cases is benign and they follow involution without medical intervention during the first decade of life.<sup>[4]</sup> That is the reason why most of the literature suggests that surgical treatment is reserved to complicated cases (nonresponsive to medical treatment or causing airway obstruction because of their rapid growth) in which the risk of lesion of anatomical structures such as the facial nerve or its branches should always be discussed and minimized using intraoperative facial nerve monitoring. Moreover, according to Weiss *et al.*,<sup>[2]</sup> preoperative



**Figure 1:** Angiographic images: anterior projection, showing the vascularization of the mass with feeding blood vessels from the right maxillary and right facial arteries (a). Lateral projection showing the dependence of the right facial artery (b)



**Figure 2:** (a) Image showing the right common carotid and the external carotid artery before the ligation right carotid artery; common carotid artery. (b) After ligation and extraction of the surgical specimen, the facial nerve and its branches were identified and preserved facial nerve trunk; (ZNB) zygomatic nerve branch



**Figure 3:** Surgical specimen after parotidectomy of 47 for 66 mm, negative surgical margins after resection

electrophysiologic changes to one or more facial nerve branches will be present in most of the patients. Moreover, the risk of severe bleeding is always present in patients with vascular malformations or tumors, and there have even been reported one death after surgery.<sup>[2]</sup> However, all these data are from pediatric population, and there is a lack of information in teenager patients.

The ligation of the external carotid artery has been described in the principles of maxillofacial trauma and oncologic surgery<sup>[6,7]</sup> as a safe procedure, useful to reduce bleeding, and improving the identification of anatomical structures without causing any sequel or very tolerable ones as the First-bite syndrome that can be caused by the parotid surgery itself.<sup>[8]</sup> However, it is a secure procedure that can be performed bilaterally and in oncologic emergencies.<sup>[9,10]</sup>

In our case, we offer surgery because the odds that the hemangioma would involute were low and also the absence of a histologic material to rule out a neoplasia were a decisive factor to propose the surgery. Since the angiography was not suitable for embolization, we proposed to the patient the ligation of the external carotid artery before surgery to reduce blood loss, to allow a better identification of the facial nerve, and to reduce risk on secondary vascular accidents and vascular spasm. Unfortunately, intraoperative facial nerve monitoring is not available in our hospital. The ligation of the external carotid artery resulted in a safe and clean surgery with minimal blood loss (150 cc) that allowed us to fully identify the facial nerve and preserve it and also achieve a complete resection. Moreover, during follow-up, we dismissed any complications. In 30 cases of ligation of external carotid artery on radical maxillectomy in the hospital, none accidents or complications were reported.

## CONCLUSION

Ligation of the external carotid artery is a safe and useful tool in parotidectomy for a hemangioma or in highly vascularized tumors, that allows the surgeon to minimize blood loss and have a cleaner surgery that helps to a better identification of all the anatomical structures.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest

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