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THROUGH THE EUSTACHIAN TUBE

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Abstract: The aim of this article is to explain a surgical approach to solve a complication on a patient treated at our hospital. It is a transmandibular-cervical approach to eliminate a cerebrospinal fluid fistula in the Eustachian tube produced after the removal of an acoustic neurinoma in a patient operated multiple times without success.

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Barcelona, 1st of June 2009

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Appreciate Dr:

I am a resident of the Oral and Maxillofacial Service of Vall d'Hebron Hospital in Barcelona, Spain.

First of all, I appreciate very much your interest in our case report about a Transmandibular-cervical approach for treatment of a CSF fistula through the Eustachian tube. We have considered the reviewer's comments and revised the article. We have also attached schematically drawings of figures 1, 2 and 3 and indicated the different vital structures and improved the quality of figure 3. Finally I have added the suggestions of the Technical and Language Editor.

I hope it would be interesting for you to publish this article in the Journal you manage and I would appreciate any modification you suggest to be sent to my e-mail.

Yours sincerely,

Josep Rubio Palau

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We have considered your comments and revised the article. We have also attached schematically drawings of figures 1, 2 and 3 and indicated the different vital structures and improved the quality of figure 3 and removed the blood smear on the retractor.

The glossopharyngeal and lingual nerve were transected in order to have a direct control of the internal carotid artery and the postoperative sequel was a hemilingual paraesthesia and trismus that was solved with physiotherapy and the patient didn't have dysphagia.

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Yours sincerely,

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# TRANSMANDIBULAR-CERVICAL APPROACH FOR TREATMENT OF A CSF FISTULA THROUGH THE EUSTACHIAN TUBE

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## **ABSTRACT**

The aim of this article is to explain a surgical approach to solve a complication on a patient treated at our hospital. It is a transmandibular-cervical approach to eliminate a cerebrospinal fluid fistula in the Eustachian tube produced after the removal of an acoustic neurinoma in a patient operated multiple times without success.

**Keywords:** Transmandibular approach; CSF fistula; Eustachian tube; Acoustic Neurinoma.

## INTRODUCTION

Cerebrospinal fluid (CSF) fistulas are complications that occur in a low percentage of skull base operations. The milder cases can be solved with conservative treatment, but in certain cases, or when the defect is bigger, it is necessary to perform an operation. This article describes the case of a patient with a CSF fistula through the Eustachian tube due to the resection of an acoustic neurinoma in which endoscopic ablation had failed several times, and therefore the surgical solution was carried out for the definitive elimination.

The case report is based on the search for a surgical solution to the definitive treatment of the recurrent cerebrospinal fluid (CSF) fistulas due to the resection of an acoustic neurinoma. In most cases, this tumour is a schwannoma, a benign tumour which originates in the vestibular branch of the VIII cranial nerve. It accounts for about 8% of intracranial tumours, and it is indeed the most frequent tumour of the cerebellopontine angle (70-85%). Its growth is slow and asymptomatic in the first stage. The malignant degeneration of these tumours is exceptional. Since this originate inside the “meatus acousticus internus”, the first symptom is caused by a direct effect or the compression of the nerve in the canal.<sup>1</sup>

Usually these tumours are unilateral and diagnosed between the ages of 35 and 60, with a slight predominance in women. If diagnosed between the first and second decades, they are normally bilateral and may be an indication of Von Recklinghausen's disease. It grows slowly and varies according to the person's age and sex, or the tumour's size.

Clinically a unilateral neurosensorial hypoacusis appears in 95% of the cases, along with a constant unsteadiness. There can also be an alteration of the gait, imbalance, lateropulsions or agoraphobia. When the tumour is larger than 2.5 cm, it usually affects the cranial nerves. The first one is usually the trigeminal, causing paraesthesia and

abolition of the corneal reflex, but rarely causing trigeminal neuralgia. The facial nerve may also be affected, causing light paresis or fasciculation. When the IX, X, XI nerves are affected, the tumour is in an advanced stage and causes swallowing and voice disorders, palate paresis and the abolition of gagging reflexes. It can also produce cerebellar symptoms or intracranial hypertension.

## **CASE REPORT**

A 68 year old woman without toxic habits had a health history of treated hypertension, mild chronic renal failure, depression and Fallopian tube surgery at age 39, and left eye cataract surgery 5 years ago.

The patient had an acoustic neurinoma operation and suffered a CSF fistula in the immediate postoperative period that did not solve with conservative measures. Due to the persistence of the fistula, the patient was operated 6 more times in order to close the pharyngeal orifice of the Eustachian tube endoscopically without success. During this period, the patient suffered 5 episodes of bacterial meningitis that required hospital treatment with intravenous antibiotic therapy of cefotaxime, ampicillin, vancomycin, metronidazole and meropenem.

Due to the persistence of the fistula, we proposed a transmandibular-cervical approach in order to finally eliminate the fistula. The patient understood and accepted the risks of the operation.

The operation was a transmandibular-cervical approach with a medial section of the lip and extension to the neck. A left vascular neck dissection (ligation of the external carotid artery, identification and preservation of the internal carotid artery, internal jugular vein, hypoglossal nerve and spinal nerve). The next step was a left paramedian mandibular osteotomy, with prior placement of two mandibular 2.0 mm miniplates. The



floor of the mouth was dissected laterally to the tongue cutting the left lingual and glossopharyngeal nerves in order to obtain a direct control of the internal carotid artery. Afterwards we practiced a paramedial section of the soft palate and medial osteotomy of the hard palate with rongeurs.

**FIGURE 1:** *Paramedial section of the soft and hard palate.*

The left Eustachian tube was identified and dissected from the medial part, cauterization of the pharyngeal aperture and four ligatures of the tube were done.

**FIGURE 2:** Identification of the Eustachian tube

**FIGURE 3:** Internal cauterization and placement of 4 transfixion ligatures

No complications occurred during the postoperative period and the patient did not have any more episodes of meningitis or otorrhea through the Eustachian tube, but suffered hemilingual paraesthesia due to the section of the lingual nerve, trismus that improved with physiotherapy and hydrocephalus which was solved with a right ventriculoperitoneal shunt.

## **DISCUSSION:**

The treatment of the acoustic neurinoma is surgical and can be performed through different approaches like the suboccipital transmeatal, translabyrinthine, suboccipital-translabyrinthine, through the middle fossa, middle fossa transtentorial translabyrinthine and subtemporal transtentorial.<sup>2</sup> The approach depends on the size of the tumour and the audiological and neurological function of the patient.

The resection of this patient's tumour produced a CSF fistula, which caused otorrhea and several episodes of meningitis. Fractures that tear arachnoid and dura mater can be another cause of fistulas. They can produce rhinorrhea or otorrhea if there is a tear in the

eardrum, or they may flow through the Eustachian tube to the pharynx and be swallowed by the patient if the eardrum is **intact**. This is why it is very important to ask the patient if they have felt the sensation of swallowing a slightly **salty** liquid. The fistula **may be localized** by tomography and injection of isotopes **via the lumbar's route**, CT or **dye** injection. The initial treatment is postural with the head high, antibiotics and **a** lumbar drain. If it persists in two or three weeks, surgical treatment must be **performed** to close the dura mater tear with **lyophilized** dura, cranial periosteum or **fascia lata** intradurally or extradurally to avoid meningitis. The bone defect can be covered with an acrylic resin **plate** or bone grafts (spongy, trephine shavings) or with muscle. In extreme cases, like this one, it is necessary to **conceive** more aggressive operations such as the transmandibular-cervical approach, to eliminate the fistula completely. There are other similar approaches, such as the transmandibular-glossopharyngeal-clival approach <sup>4, 5, 6</sup>, which differs by the section of the tongue **in** the midline to the base (included). This allows a complete opening of the pharyngeal area. The pharynx is opened from the midline after the division of the soft palate. Part of the hard palate can be removed if necessary. A bilateral maxillectomy, instead of the hard palate resection, can also be done. This procedure produces a maxillary fracture in the midline and the two parts of the maxilla are separated laterally. This approach allows the exposure of the base of the skull from the pituitary fossa to C2, and the resection of big **tumours** that affect the clivus. Nonetheless, it was rejected in this case because it couldn't offer direct control of the cervical vessels, which can be done with the transmandibular-cervical approach.

### **CONCLUSION:**

This approach can be a valid choice for cases with no other options to solve a CSF fistula through the Eustachian tube and avoid the multiple neurological complications

caused by recurrent meningitis. The numerous specific risks that can be caused by this operation must be taken into account and should be explained to the patient and reflected in a detailed informed consent.

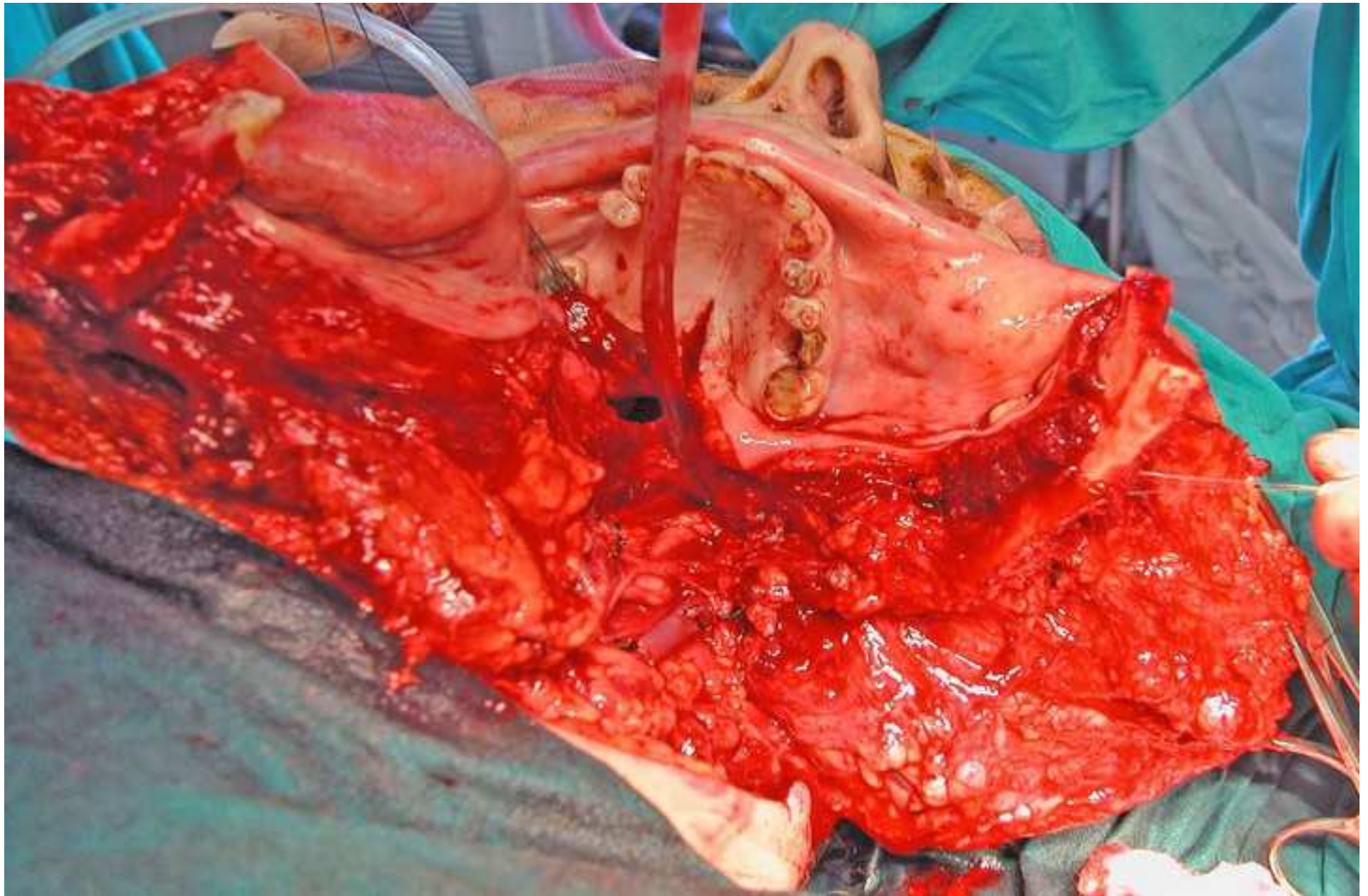
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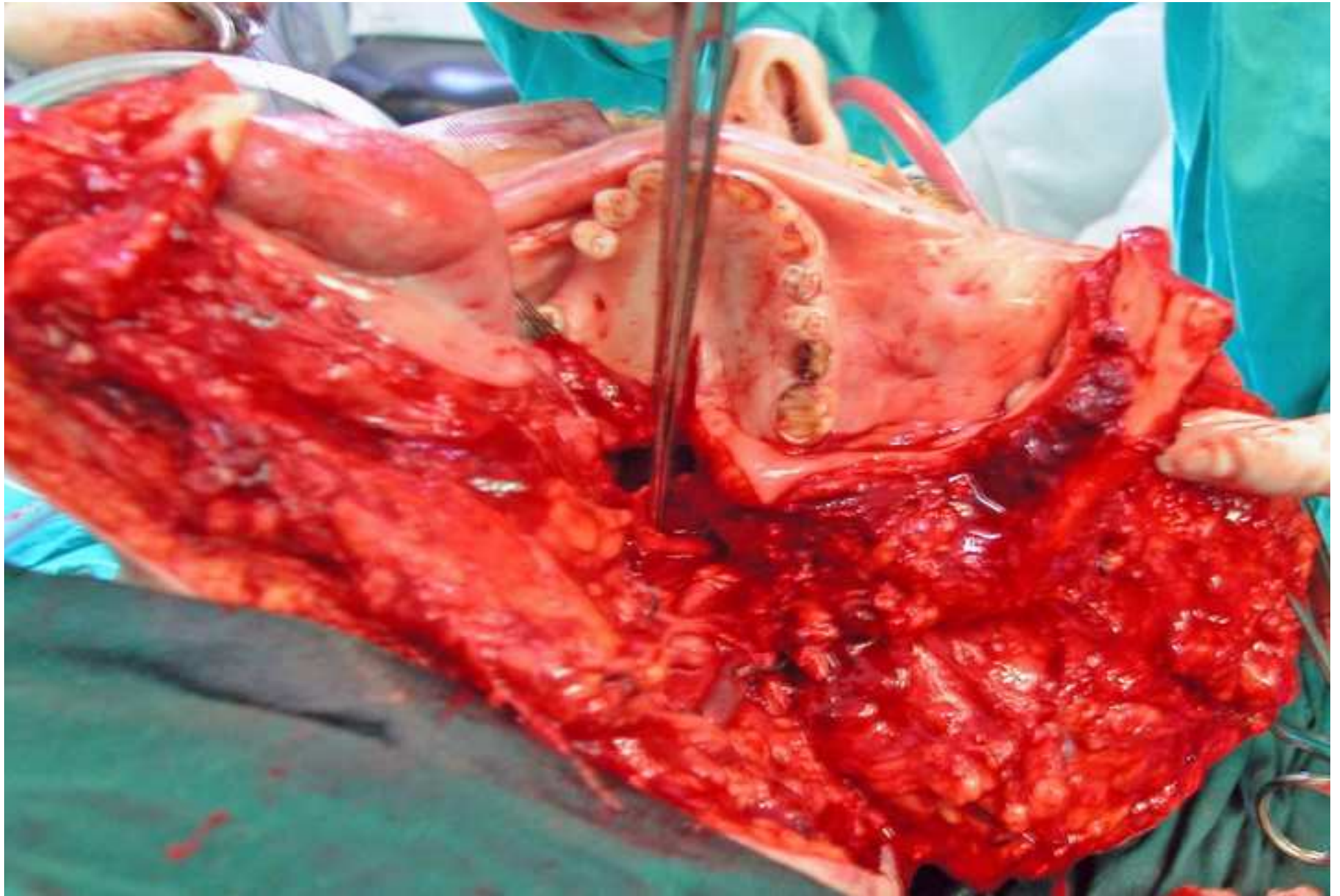
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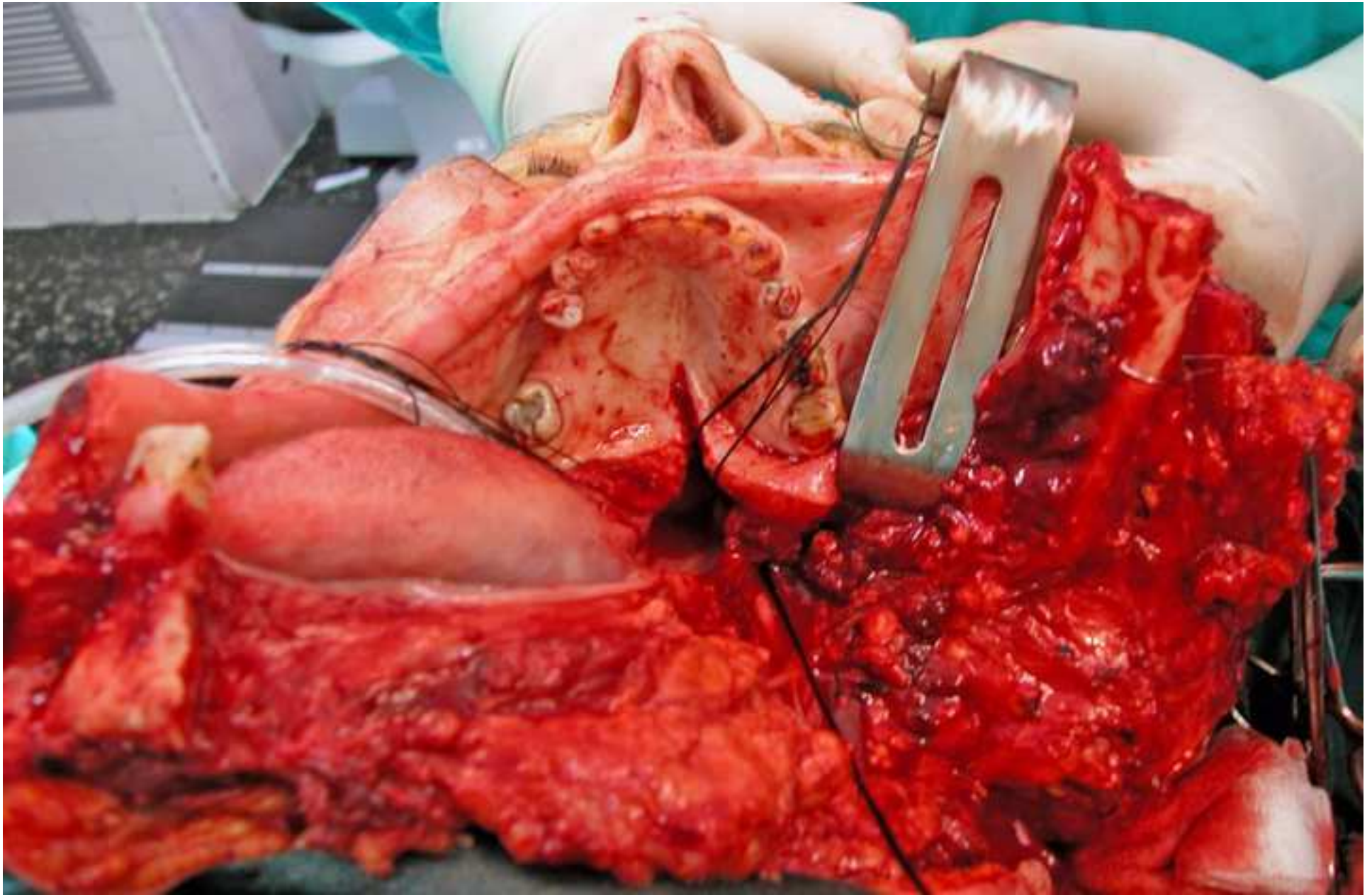


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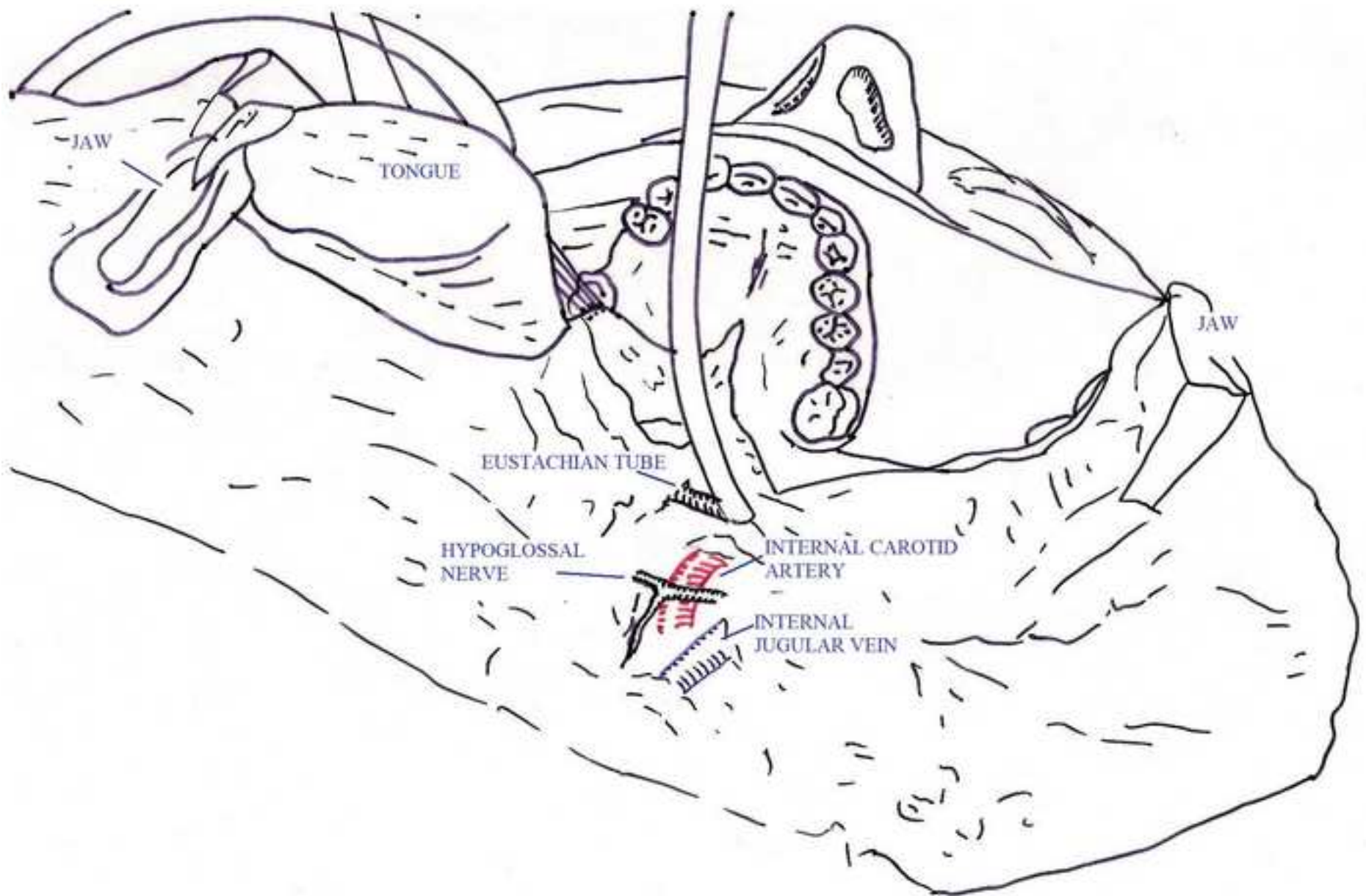




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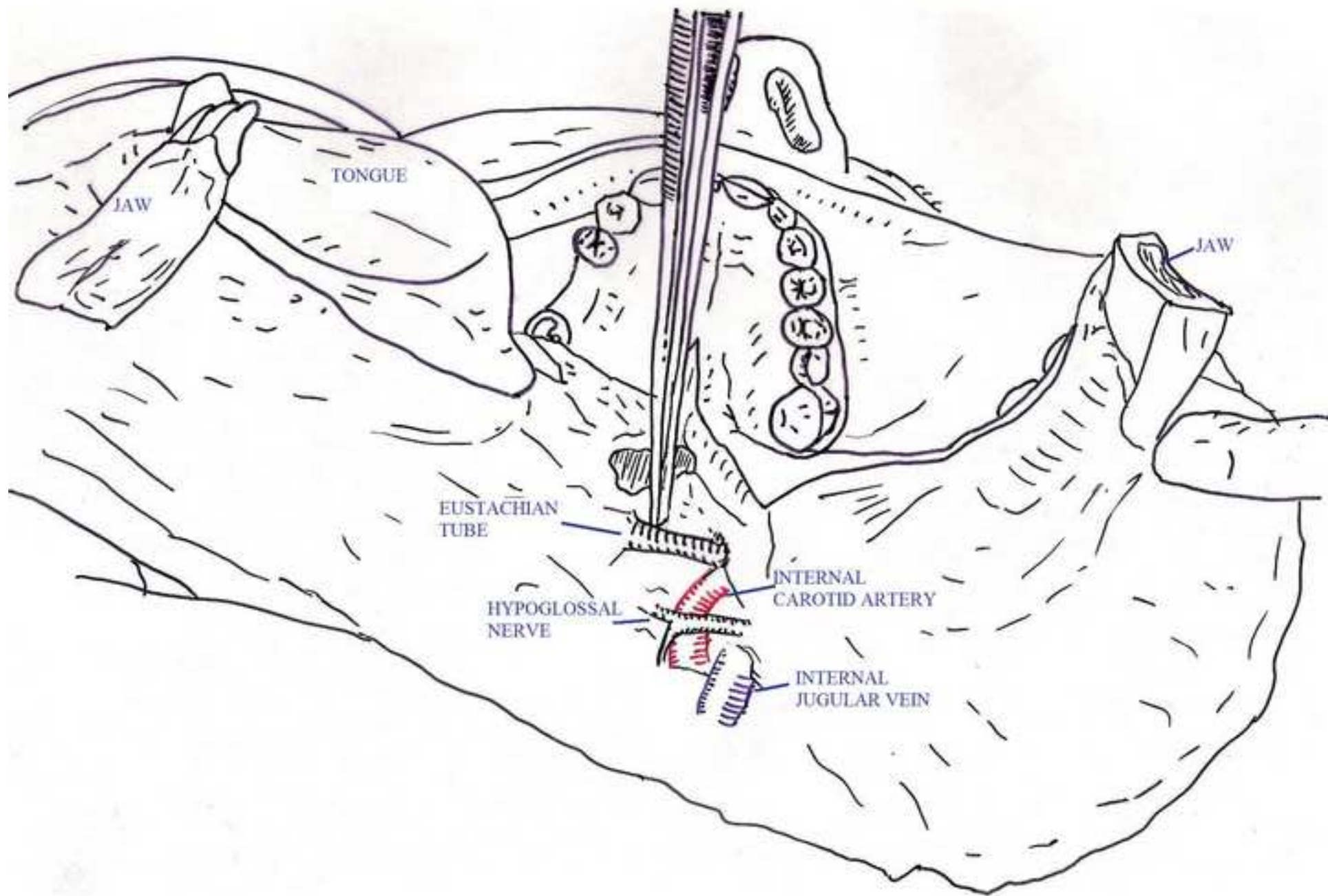


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