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Submandibular gland degloving: a modified sialoadenectomy technique for benign disease

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Key points

- We describe 35 cases of submandibular degloving, a recently encoded technique for submandibular sialoadenectomy in benign pathology
- Malignancy has been reliably excluded through clinical assessment and fine needle aspiration cytology
- It is based on blunt subfascial supracapsular dissection in order to spare fascia along with facial vessels and *marginalis mandibulae* nerve (MMN) within
- No recurrences have been recorded
- The rate of injury to the nerves at risk (MMN, lingual, hypoglossal) is lower than what reported in the literature for the "classical" transcervical and transoral techniques

Introduction:

The submandibular gland (SMG) lies deep to the platysma, encapsulated by the investing layer of the deep cervical fascia. It is lined by a capsule of connective tissue which harbours *septi* , subdividing the gland in lobes, through which the vascular and nervous components branch (figure 1).

Several benign disorders requiring a surgical excision (sialoadenectomy) can affect the SMG, such as chronic sialadenitis, often deriving from sialolithiasis, and benign tumours.

Different approaches to perform a submandibular sialoadenectomy have been described, for all of them the most frequent and feared complications are nerve injuries with obvious relevant functional and cosmetic sequelae. In fact, three important nerves lie in proximity to the gland: the marginal branch of the facial nerve (*marginalis mandibulae* nerve, MMN), the hypoglossal nerve, and the lingual nerve.

In the standard transcervical technique, the gland is removed with a layer of fascia over it and MMN is usually shielded by ligating the facial vessels lying immediately deep to it and pulling up their distal stumps (Hayes-Martin maneuver).

We recently described and demonstrated the submandibular degloving, an alternative transcervical submandibular sialoadenectomy technique for benign diseases, based on a supracapsular subfascial dissection (figure 2)[1]. The fascia is incised over the inferior aspect of the gland, and carefully dissected from the *capsula* . In this way the fascia is fully preserved along with facial vessels and MMN lying within it, without any need for a traumatic dissection of the branch. At the same time the degloving leaves a further fascial layer also on the hypoglossal nerve (whose direct exposure is not mandatory) and on the lingual nerve which is

anyway easily visualised and preserved.

In the present work, we evaluate surgical endpoints, postoperative complications and clinical outcomes of the technique, and compare them with other experiences in the literature.

Methods:

We retrospectively analysed the case records of all patients submitted to submandibular gland degloving (as previously described[1]), by the same surgeon as first operator (FB) in a single academic center from September 2017 to December 2021. Data have been collected and reported following STROBE guidelines for observational studies. The observational retrospective nature of the study allowed the exemption from IRB approval.

Preoperative work-up included: collection of clinical history, physical examination, ultrasound and, in case of clearly identifiable lesions, ultrasound-guided FNAB (Fine Needle Aspiration Biopsy) with Rapid On Site Evaluation (ROSE) as previously described[2]. We consider the submandibular degloving contraindicated, and we never performed it, in case of suspicion of solid malignancy.

We recorded demographic, clinical and surgical data in order to assess the safety of the technique.

Surgical time has been computed from infiltration of the skin to the last stitch.

Surgical drains were removed when the amount of collected fluid became less than 20 ml in 24 hours.

Post-operative follow up was performed through physical examination and concomitant neck ultrasonography, 6 months after the surgery and then every year (just for neoplastic lesions).

Results:

In the study period, 35 patients underwent submandibular degloving at our division and have been included in the present study.

Descriptive statistics, including definitive histopathological reports and complications, is summarized in table I.

No recurrences of the primary disease have been recorded in the follow up (median follow up 30 months, range 9-60 months).

Discussion:

In recent years, sialendoscopy has demonstrated effectiveness in avoiding sialoadenectomy, and therefore external approaches, in selected cases of obstructive and non neoplastic pathology[3]. In many of these cases, and in case of bulky intraductal palpable stones in the floor of mouth, the same results are obtained by transoral incision and removal.

However, in many cases of neoplastic pathology and chronic sialadenitis, sialoadenectomy remains indicated. With the advent of minimally invasive techniques, there has been a renewed interest in developing approaches that avoid visible scars, including robotic-assisted trans-hairline/retroauricular approaches (DOI: 10.1016/j.ijom.2012.04.008) and transoral robotic surgery (TORS)[4]. Yet, the "classical" transcervical approach remains the most validated and popular among head and neck surgeons, and the less demanding in terms of time and technology required. The submandibular degloving, always performed in the present series[1], is a variant of the classical transcervical approach.

In table II results and complication rate among different sialoadenectomy techniques in different series are compared.

In the present series, the most relevant complication was the postoperative bleeding in a patient with a large (4.5 cm) benign tumor (pleomorphic adenoma); such large dimensions may be a contraindication to the described technique.

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Another complication has been a surgical bed hematoma after the removal of the suction drain, associated with uncontrolled hypertension on the 6th postoperative day; it required the placement of a new suction drain and the adjustment of antihypertensive therapy, and confirmed our attitude, differently from some recent reports[5], to always use suction drains to reduce the risk of postoperative haemorrhage and infection.

Benign tumours do not disrupt the capsular layer of the gland so that if the technique is carried out correctly the risk of spillage is supposed to be minimal. This assumption is confirmed by the fact that in the present series we recorded no recurrences among the benign tumors resected.

However, in the literature, the most relevant risk in submandibular gland surgery is the damage to the nerves lying in the area. The Hayes-Martin maneuver is the most adopted trick to spare the MMN. On the other hand, the main arguments of the advocates of the intraoral approach are that it avoids the cervical incision and, most of all, the dissection in close proximity to MMN itself. However, such approaches are associated with a higher risk of lingual and hypoglossal nerves injury and limitation in tongue movements[6–89](see table II). In addition, intraoral dissection is difficult in chronically inflamed glands with severe adhesions to surrounding tissue, and conversion to the transcervical approach may be necessary[8].

Because of such a markedly higher overall rate of nerve injury in transoral approaches, the transcervical approach remains the standard for submandibular sialoadenectomy. The present work is the first series of submandibular deglovings in the literature showing a neural complication rate (only two cases of transient nerve dysfunction in the present series) lower than the classical submandibular sialoadenectomy operation[7,10–17]. Such preliminary results, if confirmed on larger series, would support submandibular degloving, based on blunt subfascial and supracapsular dissection, sparing of the fascial layer and of vessels and nerves within it[1], as a new standard for submandibular sialoadenectomy.

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Tables.

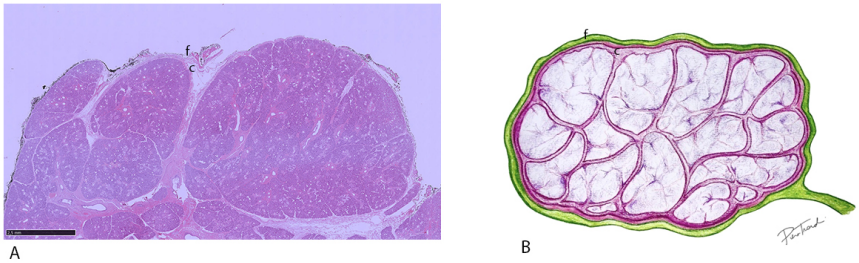
Table I . Clinical features and surgical outcomes.

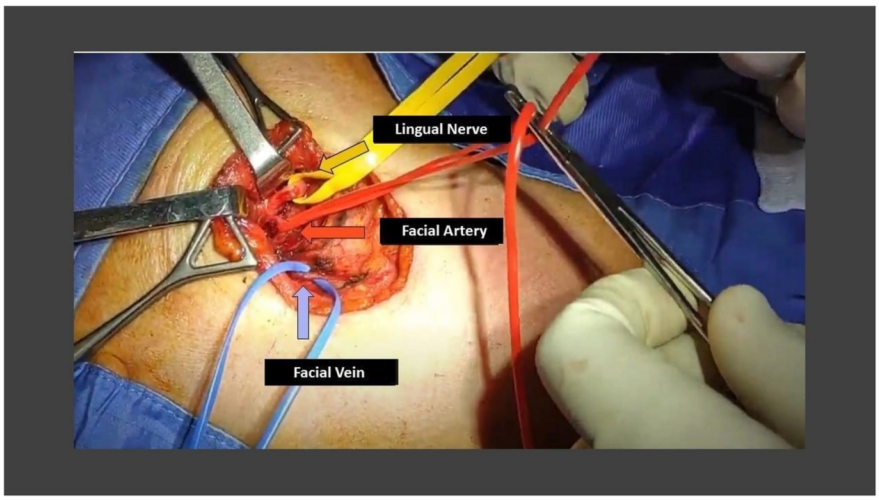
Table II. Comparison of complication rates in different series.

Figure legends.

Figure 1. A section of a resected submandibular gland (A) with residual fascia (f) on it, lying upon the capsula (c), which is a stromal component in continuity with the septi within the gland itself. The same anatomy is simplified in a drawing (B): the dissection in submandibular degloving occurs between the fascial (f, in green) and the capsular (c, in pink) planes.

Figure 2. Facial artery and vein are preserved at the end of the procedure





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