



Preservation of the facial artery in excision of the submandibular salivary gland

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SUMMARY. *Background.* The accepted method for submandibular gland excision traditionally includes ligation of the facial artery (FA) as suggested by a host of surgical atlases. Preservation of the FA may be significant in reconstructive procedures of the head and neck and its ligation may altogether be obviated.

Objective. Prospective feasibility study of FA preservation in submandibular gland excision.

Materials and methods. Patients undergoing excision of the submandibular salivary glands from September 1999 through August 2001 were prospectively included. The FA was dissected and only its glandular branches ligated. Exclusion criteria were primary benign or malignant tumors of the submandibular salivary gland or metastatic disease involving the gland or level I of the neck. In cases where the primary tumor involved the floor of mouth, anterior tongue or mandible, resection of level I contents included the FA even in N0 necks.

Results and conclusions. 104 patients (116 procedures) were included in the study. 81 patients underwent resection of the gland with preservation of the FA. The vessel was sacrificed in 35 necks because of metastases or primary tumor and in two cases of chronic sialadenitis. One patient had a postoperative hematoma following neck dissection requiring re-exploration. The source of bleeding was not found to be related to the FA. Contrary to accepted methodology, the FA may readily be preserved in surgery of the submandibular salivary glands. We suggest preservation of the FA in all cases of procedures for benign disease and in selected cases of malignancy.

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Introduction

Leading surgical atlases overlapping four decades of publication unanimously promote ligation of the facial artery (FA) during submandibular gland excision.^{1–8} This point is underscored by Lee (3) indicating that the FA often penetrates the ‘substance of the submaxillary gland inferiorly’ and, therefore, warrants resection.

The platysma myocutaneous flap is used for reconstructing small oral cavity and pharyngeal defects. In harvesting this flap, the FA is best preserved and if its submental branch cannot be preserved an alternative reconstructive technique should be selected.⁹ Saito et al¹⁰ demonstrated that preservation of the FA in neck dissection significantly improves this flap outcome. In lower lip reconstruction using Bernard’s technique, the FA has to be preserved so blood supply to the cheek advancement flaps is not compromised. When neck dissection is done with this procedure, the FA need be preserved despite clearing of level I contents with the submandibular gland included.

Preservation of the FA is readily done and our experience with platysma flap and Bernard’s technique use, led us to assess the feasibility of preserving the FA routinely in the majority of submandibular gland excisions.

Methods

Patients undergoing excision of the submandibular gland either as an isolated procedure or as part of neck dissection from September 1999 to August 2001 were prospectively included in the study. Exclusion criteria were primary benign or malignant tumors of the submandibular salivary gland or metastatic disease involving the gland or level I of the neck. In cases where the primary tumor involved the floor of mouth, anterior tongue or mandible, resection of level I contents included the FA even in N0 necks except in cases where large defects of the lower lip were reconstructed. The number of glandular branches was noted.

Results

104 patients, 65 male (mean age 61 years) and 39 female (mean age 68) were included in the study. 116 procedures were performed; 73 patients underwent 85 neck dissections and 31 patients had unilateral resection of the submandibular gland. Of those nine were for benign tumors of the gland and 24 for chronic sialadenitis and sialolithiasis. Overall, the FA was preserved in 81 patients and sacrificed in 23 (35 necks). The vessel was

sacrificed because of metastases in level I, anterior floor of mouth or anterior tongue tumors or primary tumor of the gland and in two cases of chronic sialadenitis. One patient had a postoperative hematoma following neck dissection requiring exploration. The source of bleeding was not found to be related to the FA.

The anatomy of the intraglandular course of the FA charted in 25 cases consisted of 1 (1 case), 2 (2 cases), 3 (15 cases) and 4 (7 cases) branches descending into the gland parenchyma. The proximal branch was usually somewhat wider than the following branches and was usually ligated. In all but two cases with chronic sialadenitis, the artery was readily dissected from the gland.

Discussion

The anatomy of the FA was studied in relation to surgical application in flap reconstruction.^{11–13} A variable course was noted in the submandibular region with three types of arteries described according to depth.¹¹ The submental branch supplying the submental artery flap arises after the FA exits from the submandibular gland.¹⁴ Anatomic texts¹⁵ describe three to four vessels supplying the gland and lymphnodes, the neighboring muscles and overlying skin.

The FA was easily dissected in all but two cases from the glandular parenchyma. The glandular branches were cauterized although the first branch was usually ligated. The procedure is not significantly prolonged and no cases of related bleeding were encountered.

Although the arterial supply of the face is abundant, sacrifice of the FA may compromise use of selected flaps for reconstructive applications. Also, the FA may be readily used for anastomosis of free flaps if needed. As preservation of the FA does not significantly prolong the procedure or leads to complications, the time honored principle of 'do no harm' should be adhered to.

Conclusion

The FA need not be sacrificed in routine excision of the submandibular salivary glands. In order to prevent compromise of oncological or benign tumor resection, the FA should at this stage be resected according to current practice.

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