

# Transcervical submandibular gland surgery; management, outcome, and complications of 120 cases

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## Abstract

Surgical intervention is the treatment procedure of many diseases of the submandibular gland such as sialolithiasis, chronic sialoadenitis, and tumors. This study aims to analyze the management, outcomes, and complications of transcervical submandibular gland excision cases of a tertiary clinic and to discuss the results in light of the current literature knowledge. 120 cases who applied to a tertiary otorhinolaryngology clinic between 2014-2019 and who underwent submandibular gland excision were analyzed retrospectively. Postoperative histopathological results revealed that 108 cases were benign and 12 of cases were malignant. The most frequent benign pathology was chronic sialoadenitis in 82 cases. The most common non-malignant tumor was pleomorphic adenoma in 16 cases. Although the result obtained with fine-needle-biopsy was benign in 2 patients, the histopathological result after surgery was malignant (adenocarcinoma in 1 patient, mucoepidermoid carcinoma in 1 patient). As complications of surgery; marginal mandibular nerve injury in 11 cases (permanent in 2 cases) and hematoma in 7 cases were noted. A benign fine-needle aspiration biopsy result does not necessarily exclude malignancy in submandibular gland masses. As a result, we found that the percentage distribution of our submandibular gland histopathological results is consistent with the literature. Although marginal mandibular nerve injury is one of the most common complications of submandibular gland excision, transcervical submandibular gland excision is still a reliable surgery.

**Keywords:** Submandibular gland, surgery, histopathology, fine-needle aspiration biopsy, complication

**Abbreviations:** Computed tomography, (CT); Fine-needle-aspiration-biopsy , (FNAB); Magnetic resonance imaging, (MRI); Submandibular gland, (SG); Ultrasonography, (USG).

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## Introduction

Primary lesions of the submandibular gland (SG) are quite rare compared to parotid masses. SG lesions can be of inflammatory, cystic, or neoplastic type. We can achieve diagnosis by evaluating the patient's age, complaints, clinical findings, and assisted diagnostic methods together.

SG pathologies frequently include sialolithiasis, sialoadenitis, benign and malignant tumors. Sialolithiasis is the most often form of salivary gland disease and is the most frequent reason for salivary gland dysfunction. Its prevalence in the community is 1% and it is more in men [1,2]. 80% of saliva calculi arise in the SG, 20% in the parotid, 1-2% in the sublingual gland, and small salivary glands. Although the calculi can be seen in the canal, we often find it in the gland's hilus [3]. 3% of all head-neck tumors are seen in salivary glands. 70-80% of these arises from the parotid, 10% from the SG, and 1% from the minor salivary glands [4,5]. Approximately 50% of those seen in the SG are malignant. Among the SG malignant tumors, adenocystic carcinoma is the most common [6].

Excision is the treatment procedure of many diseases of the SG, such as sialolithiasis, chronic sialoadenitis, and tumors [7]. Lingual nerve, hypoglossal nerve, and marginal mandibular nerve may be injured because of a close neighborhood during the removal of the gland [5].

This study aims to analyze the management, outcomes, and complications of transcervical submandibular gland excision cases of a tertiary clinic and to discuss the results considering the current literature knowledge.

## Materials and Methods

The Ethical Committee of Afyonkarahisar Health Sciences University approved the study with Ethical Institution Code: 2011-KAEK-2 no: 109.120 cases of SG excision of a tertiary otorhinolaryngology clinic, between 2018-2021, were analyzed retrospectively. We reviewed the anamnesis and examination findings of the patients. Age, gender, complaints,

and physical examinations were noted. For preoperative evaluation, all patients underwent ultrasonography (USG) and fine-needle-aspiration-biopsy (FNAB). CT (computed tomography) and MR (magnetic resonance) imaging were also requested for patients who were reported as malignant or suspicious because of FNAB. We additionally applied neck dissections to the patients detected as malignant.

## Results

75 (62.5%) of the patients were male and 45 (37.5%) were female, with an average age of 43.2 (13 years-79 years). The most common complaints were painless swelling in 70 (58%), painful swelling occurring after meals in 17 (14%), and frequent infections in 17 (14%). We detected calculi in 80 of 120 patients (67%) in USG (Figure 1,2). In terms of malignancy exclusion, we performed FNAB in all patients, and 16 patients had pleomorphic adenoma, 4 patients had flat epithelial cell carcinoma, 2 patients had mucoepidermoid carcinoma and 8 patients had atypical cells. SG excision was performed in all patients via transcervical approach. We found all the 80 patients who had calculi in USG to have calculi during surgery. We observed that there were 2 calculi in the channel in one patient. In 70 (58%) of the cases, the right SG excision was performed in 50 (42%). We performed functional neck dissection on the same side in malignant cases. Histopathological results revealed that 108 cases were benign and 12 of the cases were malignant. The most often benign pathology was chronic sialoadenitis in 82 cases. The most often benign tumor was pleomorphic adenoma in 16 cases. Although the result of FNAB was benign in 2 patients, histopathological results were malignant (adenocarcinoma in 1 patient, mucoepidermoid carcinoma in 1 patient).

We diagnosed 4 of 12 malignant cases as undifferentiated carcinoma, 5 of them were squamous cell carcinoma and 3 of them were mucoepidermoid carcinoma. We showed histopathological evaluation results in Table 1.

As complications of surgery; marginal mandibular nerve injury in 11 cases (permanent in 2 cases) and hematoma in 7 cases were noted.

Table 1. Histopathological results

Histopathologic Diagnosis	Number of Patients
Chronic sialadenitis	82
Pleomorphic adenoma	16
Indifferentiated carcinoma	4
Mucoepidermoid carcinoma	3
Squamous cell carcinoma	5
Total	120

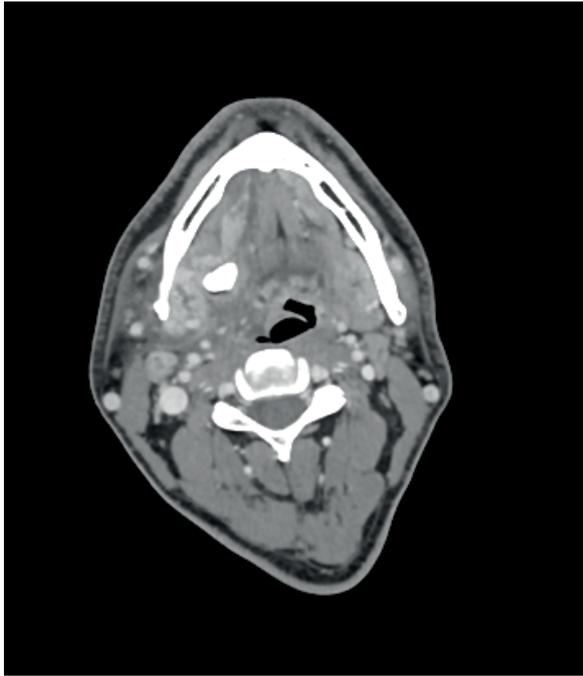


Figure 1. CT image of the submandibular gland (calculi on the right side)



Figure 2. Right submandibular gland and calculi

## Discussion

In a significant part of the SG surgeries, the cause is chronic infections of the salivary gland

that develop secondary to the calculi in the salivary gland. In autopsy studies, the incidence of sialolithiasis is noted as 1%, but clinically symptomatic calculi are much rarer. 80-92% of symptomatic calculi cases originate from the SG [8]. The reasons that SG has more frequent calculi than other major salivary glands are because of the more alkaline structure of the produced saliva content, more mucin, longer gland duct, and richer in calcium and phosphate content. We consider calculi being formed because of the accumulation of calcium salts around the nucleus, which comprises spilled epithelium cells, bacteria, and salivary mucins [9]. Salivary gland calculi are usually single and maybe two or more in approximately 3-4% of patients. Unlike parotid, SG calculi shows more intracanal placement [10,11]. In our study, 80 patients had calculi and only 1 patient had 2 calculi in the canal.

50% of SG tumors are malignant and the most often malignant pathology is adenocystic carcinoma. In pleomorphic adenoma surgery, there is a high probability of recurrence when enucleation applies to the tumor and cannot be expunged. Therefore, the total removal of the gland is recommended as a standard approach [12,13]. Neck dissection and radiotherapy should be added to the treatment when necessary. In our study, we reported 4 of 12 malignant cases as undifferentiated carcinoma, 5 of them were squamous cell carcinoma and 3 of them were mucoepidermoid carcinoma.

Among the head-neck masses, FNAB shows the lowest sensitivity for the SG masses [14]. FNAB is a method of diagnosis that can be performed easily, can be got quickly and is minimally invasive. Most salivary gland masses are superficial and sufficient aspiration material

can be got by FNAB [15]. In our study, although the results of FNAB were benign in 2 patients, histopathological results were malignant (adenocarcinoma in 1 patient, mucoepidermoid carcinoma in 1 patient). In 1 patient who was also reported as sialolithiasis by USG, FNAB revealed suspected malignancy and postoperative pathology was mucoepidermoid carcinoma.

USG is the most frequent method used in the diagnosis of submandibular lesions because of its non-invasiveness, low cost, and easy accessibility [11,16]. It is especially useful in SG superficial lesions [17]. Papaspyrou reported the sensitivity and specificity of USG as 87% and 81.3%, respectively, in the diagnosis of sialolithiasis [18]. We also performed USG for all patients with whom we considered SG surgery. We also requested CT and MRI for surgical planning and evaluation of the neck for cases of suspected malignancy.

Transient marginal mandibular nerve injuries after transcervical SG surgeries are reported in the literature as high as 36%, and permanent nerve injury as high as 12% [19]. In our study, we observed the marginal mandibular nerve injury in 11 cases, 2 of which were permanent. The point to be considered minimizing the risk of marginal mandibular nerve injury is the necessity to search for the nerve by approaching the two fingers from the mandibular corpus inferiorly during the subplatysmal plane during surgery.

We can sort other surgical complications of SG excision as hematoma, hypoglossal nerve damage, lingual nerve damage, and wound infection.

## Conclusion

Knowing the possible preoperative diagnosis in SG masses provides an important advantage to the surgeon in planning the operation and preparing the patient for the operation. When evaluating the mass, the patient's age, gender, duration of the disease, complaints, clinical findings, imaging methods, and FNAB should be assessed together. For patients admitting with a mass in the submandibular gland, the diagnosis was mostly chronic sialadenitis and sialolithiasis.

Transcervical SG excision is satisfactory with low complication rates when surgical techniques are applied correctly.

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## Conflict of interest

Any of the authors declare no conflict of interest.

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