# Salivary Gland Surgery: is it feasible as a same-day surgery?

*S Santos[1*]; A Flores[2]; C Pinto[2]; S Neves[2]; B Barbosa[2]; A Povo[2]; C Magalhães[2,3]*

## Abstract

Ambulatory surgery has grown over recent decades, improving cost-effectiveness and patient satisfaction. While same-day surgery is considered safe with proper selection and experienced teams, no specific guidelines exist for outpatient major salivary gland procedures. We retrospectively analyzed 18 patients who underwent ambulatory salivary gland surgery between January 2015 and March 2024. Most cases involved the parotid gland; histology revealed 10 benign tumors, 1 malignancy, and other lesions such as mucoceles. Over half (58%) had no postoperative complications; seroma/sialocele formation was the most frequent. Outpatient salivary gland surgery is safe and feasible with careful patient selection and appropriate postoperative follow-up.

**Keywords: Outpatient, Salivary Gland Surgery, Surgical Complications.**

**Authors' Addresses:** [1] Department of Maxillofacial Surgery, Unidade Local de Saúde Santo António, Porto, Portugal.
[2] Department of General Ambulatory Surgery, Unidade Local de Saúde Santo António, Porto, Portugal.
[3] Department Head of General Ambulatory Surgery, Unidade Local de Saúde Santo António, Porto, Portugal.

**Corresponding Author:** Sara Sofia Pereira Santos, Unidade Local de Saúde Santo António, 4099-001 Porto. *Email:* saraspsantos13@gmail.com

## Introduction

Ambulatory surgery has been rising exponentially in the last decades, driven by enhancements of surgical and anesthetic techniques, as well as day-care units conditions (1,2). These innovations contributed to significative gains in surgery cost-effectiveness ratio and patients' satisfaction, without a concurrent increment in postoperative complications or re-admissions rates. Recent systematic reviews and meta-analyses have shown the safety and feasibility of same-day surgery, taking into consideration careful patient selection, surgical team expertise and type of surgery proposed (3-9). Nevertheless, regarding major salivary gland surgery, no formal guidelines exist concerning patients' eligibility for an ambulatory surgical approach (10), dissimilarly to procedures as thyroidectomy (11).

Latest evidence in salivary gland surgery field have demonstrated similar outcomes and complication rates when comparing outpatient and inpatient surgery modalities (12-16). However, a great proportion of the published literature rely on the parotid gland surgery, since this gland is the most frequent site of salivary gland tumors (17). As a consequence, the feasibility of outpatient salivary gland surgical procedures, in particular involving submandibular and sublingual glands, remains unclear.

The main purpose of the present study was to summarize the cases of salivary gland surgery performed in Ambulatory Surgery Center of Hospital de Santo António, in Porto, Portugal. We aimed to demonstrate the safety and feasibility of these surgical interventions, analyzing patients' characteristics, type and duration of the procedures, and complication rates, from the immediate postoperative period until 6 to 12 months following discharge.

## Methods

### *Study design and sample*

A retrospective analysis was made, comprising all patients submitted to same-day salivary gland surgery, from January 2015 to March 2024, in Ambulatory Surgery Center of Hospital de Santo António, in Porto, Portugal. Patients who underwent salivary gland surgery in an inpatient regimen, or having reports with missing information were excluded. Outpatient procedures were defined as surgeries from which patients were discharged within 24 hours after admission.

### *Variables*

Data regarding patients' sex, age, surgery performed, operative time, histological classification of the anatomical specimen, and postoperative complications were collected. Anesthetic evaluation was performed using ASA-PS classification (American Society of Anesthesiologists – Physical Status). Histological classification of the anatomic specimens were analyzed likewise, according to World Health Organization Classification of Head and Neck Tumors.18

Most common surgical complications from approaches to salivary glands were analyzed, including formation of hematoma, seroma or sialocele, transient and permanent nerve paresis or paresthesia, surgical site infection, fistula formation, Frey's syndrome, and wound healing anomalies. Records of postoperative appointments, from 6 to 12 months following surgery, were used to evaluate the occurrence of surgical complications.

### *Ethical approval*

This study was approved by the Ethics Committee of Unidade Local de Saúde Santo António (Reference No. 2024.157 - 128/DEFI/140-CE). All procedures were conducted in accordance with the ethical standards of the Declaration of Helsinki and institutional guidelines.

## Results

A total of 18 cases were included, as shown in Table 1. Most cases were male (61.11%), with a mean age of 43 years. Operative time was, on average, 43 minutes, with the longest surgery taking about one-hour and a half. Solely one patient was classified as ASA III, whereas 7 and 10 patients were given the classification of ASA I and II, respectively.

The parotid was the most frequent gland involved (50%), followed by minor glands (33%). No sublingual gland surgeries were recorded. Regarding histological classification, displayed in Table 2, 61% of the specimens revealed tumoral pathology, with only one being classified as a malignant tumor (lymphoma). The benign tumors identified include pleomorphic adenomas (6 cases) and Warthin tumors (4 cases). The remaining 39% of the cases comprised essentially cystic conditions, namely mucoceles.

**Table 1** Perioperative characteristics of patients and clinicopathology.

| Characteristics | Cases (n = 18) |
|---|---|
| Sex (M/F) | 11/7 |
| Age (mean, years) | 43 |
| ASA-PS (I/II/III) | 7/10/1 |
| Operative time | |
| (mean, in minutes) | 43 |
| (minimum/maximum) | 8/95 |
| Involved salivary gland | |
| Parotid | 9 |
| Submandibular | 3 |
| Sublingual | 0 |
| Minor salivary gland | 6 |

M – masculine; F – feminine
ASA: American Society of Anesthesiologists Physical Status

**Table 2** Perioperative characteristics of patients and clinicopathology.

| Characteristics | Cases (n = 18) |
|---|---|
| Histological classification | Cases (n= 18) |
| Benign tumor (%) | 10 (55.56%) |
| - Pleomorphic adenoma | 6 |
| - Warthin's tumor | 4 |
| Malignant tumor (%) | 1 (5.56%) |
| - Lymphoma | 1 |
| Other conditions (%) | 7 (38.89%) |
| - Mucocele | 5 |
| - Hemangioma | 1 |
| - Chronic sialadenitis | 1 |

More than half (58%) of the patients of the present study had no postoperative complications (Table 3). The most prevalent complication was seroma / sialocele formation (3 cases), whilst more impactful disabilities, such as permanent nerve paresis / paresthesia, were not found. All complications listed occurred in different patients. Although one of the patients complicated with a cervical postoperative hematoma, requiring immediate reoperation for drainage, the patient was discharged on the same day, without further complications.

**Table 3** Postoperative complications.

| Postoperative complications (%) | Cases (n = 18) |
|---|---|
| Hematoma | 2 (11.11%) |
| Seroma / Sialocele | 3 (16.67%) |
| Transient nerve paresis / paresthesia | 1 (5.56%) |
| Permanent nerve paresis / paresthesia | 0 (0%) |
| Infection | 1 (5.56%) |
| Fistula formation | 1 (5.56%) |
| Frey's syndrome | 0 (0%) |
| Wound healing anomaly | 0 (0%) |

It is important to emphasize that the patients were followed for a period between 6 and 12 months after surgery, with no complications present at the postoperative appointment at discharge time. None of the patients was readmitted in hospital after discharge.

# Discussion

Following the rising tendency of same-day surgery, attempts have been made to balance cost effectiveness and high-quality surgery. Considering salivary gland surgery, Steekler started in 1991 performing parotidectomies in an outpatient regimen, suggesting its safety and validity to suitable patients and pathologies (19). However, despite the shift towards outpatient surgery in the last decades, no structured criteria exist for selection of patients for outpatient surgery. Consequently, the existing data exhibits considerable heterogeneity, limiting conclusions when comparing outpatient and inpatient surgeries. Doubts remain if salivary gland surgery in ambulatory setting is feasible, without prompting higher postoperative complication rates and readmissions.

The present study sought to demonstrate the feasibility and effectiveness of ambulatory surgery to salivary glands, presenting a series of cases performed in the last 9 years in an Ambulatory Surgery Center in Porto, Portugal. Regardless of the fact that parotid tumors represent about 70% of the tumoral conditions (17), surgeries to other salivary glands, major and minor, where also included. In our sample, only 50% of the cases involved the parotid (Table 1), primarily due to the inclusion of minor salivary glands in the study.

Considering histological classification, displayed in Table 2, solely one of the cases presented was malignant. Even though some studies include the diagnosis of benign pathology as a requirement to perform outpatient surgery (13,20,21), the type and extent of salivary gland surgery in cases of malignancy is still controversial, particularly the amount of parotid tissue to be excised in malignant tumors (22). Some reports stated that, for superficial tumors (classified as T1 or T2) (23), partial or superficial parotidectomy can be adequate to remove the tumor, maintaining optimum outcomes (24-26). On that account, for selected cases, the histological diagnosis of a malignant tumor should not be an exclusion criterion for ambulatory surgery.

Evidence about surgery to major salivary glands other than parotid is sparse, specifically in ambulatory setting. The rationale is primarily based in anatomical accessibility and surgical complexity, given that submandibular and sublingual glands are more deeply located, and have a closer relation with mandibular marginal, lingual and hypoglossal nerves (27). Our study included three cases of submandibular pathology (two pleomorphic adenomas, and one case of sialolithiasis), submitted to sialoadenectomy. Despite the greater surgical complexity, this did not result in significantly longer operative times; all submandibular sialoadenectomies were performed in less than 1 hour (38, 43, and 55 minutes). It is noteworthy that two of these cases complicated with hematoma: one in the immediate postoperative period, requiring surgical drainage, and one on the 5th day after surgery, managed with conservative measures. Although significant complications, both cases were adequately managed in outpatient setting, with complete resolution and without further need of inpatient admission or recurrence.

Regarding anesthetic evaluation, ASA-PS classification was used to summarize patients' eligibility for same-day surgery. This method, although deemed subjective, is recognized as a good predictor of perioperative risk (28). Only one of our patients was classified as ASA III, with the remaining 17 being classified as healthy patients or having medically controlled mild to moderate systemic disease. A review by Rajan et al., presenting a summary of recent evidence to guide ambulatory patients selection (29), concluded that notwithstanding most of ambulatory surgery patients are classified as ASA I or II, ASA III patients can be considered suitable for surgery since their comorbidities are stable, and even ASA IV patients may undergo low-risk procedures under local anesthesia.

This study has some limitations, namely a retrospective data collection method, and a small sample size, restraining the possibility of conducting sub-analyses per type of salivary gland, type of pathology, or surgical technique. Nevertheless, we perceive the breadth of pathologies and salivary glands involved as a strength of this paperwork, given the scarcity of studies reporting cases involving salivary glands other than the parotid gland.

The limited sample size could also have contributed to the not negligible postoperative total complications rate (42%), when comparing the present study with the available literature. However, it is important to note that the complications monitored have not have the same level of severity. This underlines the importance of further studies with larger sample sizes, in order that individual complication rates could be assessed.

Within the limitations of this paper, we acknowledge that outpatient salivary gland surgery is safe and feasible, provided a careful patient selection and an adequate postoperative follow-up. Potentiated by these positive results, we expect this report can contribute to the development of a standardized protocol for ambulatory surgery patients' selection, comprising clinicopathological, anesthetic and social criteria.

## *Additional Information*


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### Conflicts of Interest

The authors declare no conflicts of interest related to this study.

### Use of AI or AI-based software

No artificial intelligence-based software was used in the writing of this manuscript.

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