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# Stain-guided parotidectomy: a preliminary report of our experience. January to June 2024

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**Abstract:** Objective: Evaluate the usefulness of stain- guided parotidectomy in patients with parotid tumors in the Head and Neck Services of the Hospital Oncology Social Security Service and the Otorhinolaryngologic Service of the "Dr. Carlos Arvelo" Military Hospital January to June 2024. Method: A descriptive, prospective study was conducted with a sample of 17 patients. Results: Age uniform distribution in the ranges 15-30, 31-45, 46-60 years with 5(29.4 %), 61-74 years with 2 (11.8 %). The female sex predominated with 14 (82.4 %) over the male sex 3 (17.6 %). Predominance of left parotid tumors 9 (52.9 %) vs. 8 (47.1 %) right. The predominant histological type was pleomorphic adenoma in 15 patients (88.2 %), carcinoma ex pleomorphic adenoma in 1 (5.9 %), and high-grade mucoepidermoid carcinoma in 1. Superficial parotidectomy as a surgical procedure predominated in 15 (88.2 %) patients and total parotidectomy with neck dissection in 2 (11.8 %). The complications observed included facial edema in 4 (23.5 %) patients, paresis in 3 (17.6%) reported as House Brackmann (HB) II, transient periatrial dysesthesia in 3 (17.6 %), and salivary fistula in 1 (5.9 %). Facial nerve identification and parenchymal staining were achieved in 17 patients (100.0 %). Conclusion: Treatment for salivary gland neoplasms should be individualized. In our experience, the integration of methylene blue as an intravital staining agent in parotid surgery has shown promising potential, with fewer sequelae in patients, which translates into adequate aesthetic, functional and oncological results.

**Key words:** parotid; surgery; methylene blue; facial nerve; paresis

## 1 Introduction

The parotid glands (PG) are the largest pair of salivary glands and are located in the preauricular region. Their upper border corresponds to the zygomatic arch, while the anterior border can extend over the masseter muscle together with its excretory duct, the parotid duct (Stenon) that will pass through the buccinator muscle at the level of the second maxillary molar to reach the oral cavity. Medially, the gland communicates with the parapharyngeal space. The lower pole of the PG extends to the anteromedial margin of the sternocleidomastoid muscle (SCM) (Figure 1). Anatomically, the PG is divided into two lobes: superficial and deep, because it is crossed by the facial nerve (FN). The parotid gland has three faces that are in contact with the platysma muscle, the ascending branch of the mandible, and the mastoid process [1,2].

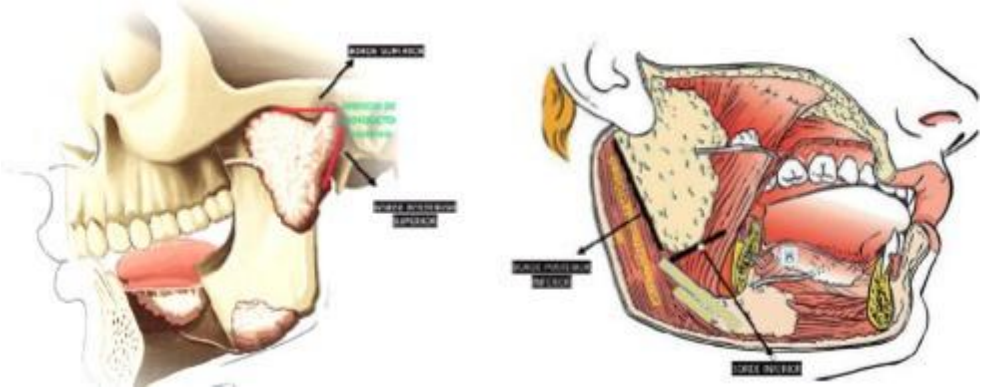

Figure 1. Borders of the parotid gland. Adapted from Orbe C. "Importance of the salivary glands." Santo Domingo: Editorial Listin Diario S; 2012

The name "parotid" derives from its anatomical location: ("para" means "around" and "otid" means "ear.") Its importance lies in the fact that it contributes 45% of the saliva in the oral cavity, representing between 45 mL and 65 mL, which is a more serous fluid that mainly facilitates the swallowing of the food bolus, compared to the other glands [3].

Salivary gland cancers account for approximately 3% of all malignant head and neck lesions diagnosed each year, most of which are located in the PG. Approximately 80% of salivary gland tumors occur in the PG. Of these tumors, 75% to 80% are benign and of epithelial origin [4].

In general, the smaller the gland, the more likely the tumor is to be malignant. Thus, 20% of parotid neoplasms, 50% of submandibular neoplasms, and 60% of neoplasms located in minor salivary glands are malignant. In the tongue and retromolar area, all tumors are malignant, while in the upper lip, 70% are benign [5].

The approximate incidence of salivary gland tumors is 2.5 to 4 cases per 100,000 inhabitants, with a similar male/female ratio. It is a disease that typically affects adults, with a mean age of onset of 45 years, affecting children in only 5% of cases [5].

The etiology of salivary gland tumors is unknown. Some studies show a higher incidence among Eskimos in Greenland, Scotland, Israel, and Malaysia. Patients who have received radiotherapy and survivors of the atomic bombs in Hiroshima and Nagasaki have a higher incidence of these tumors, so previous exposure to radiation is a risk factor. Genetic alterations, such as allelic loss, monosomy, and trisomy, have also been linked to their development [5].

Smoking is related to Warthin's tumor, but not to other types of salivary neoplasms. The data on alcohol abuse are inconclusive. Specific risk factors for the development of malignant salivary neoplasms include a history of previous cancer, dietary factors (low intake of vitamin C and dietary fiber, excess cholesterol), occupational exposure (radiation or radioactive materials, rubber, wood dust, silica), and infection with the Epstein-Barr virus (undifferentiated carcinoma) [5].

The classification of salivary gland tumors is complex due to their great histological diversity. There are numerous classifications, but the most widely recognized are those of the WHO (Table 1) and the "Armed Forces Institute of Pathology" (AFIP) by Ellis and Auclair from 1996. Both classify tumors according to their microscopic appearance. It is often difficult to distinguish a benign lesion from a malignant one, especially when analyzing small fragments. The key to diagnosing a malignant neoplasm is the demonstration of infiltrative margins [6].

The diagnostic methodology is based mainly on the patient's medical history, supported by a clinical examination performed by a medical professional. Extension studies such as ultrasounds, computed tomography (CT), and magnetic resonance imaging (MRI) are key to determining the location, size, and extent of the lesion. Finally, the histological nature of the neoplasms is determined through anatomic pathology studies, especially fine-needle aspiration biopsy [7].

The usual clinical manifestation of a tumor originating in the parotid gland is the appearance of an asymptomatic mass (incidental finding), most of which are located in the superficial lobe at the tail of the gland and present as a palpable, elastic, preauricular nodular mass. Tumors located in the deep lobe usually appear as diffuse growths and cause a feeling of fullness behind the jaw at the level of the gland. The presence of ipsilateral cervical lymphadenopathy or NF dysfunction, as well as invasion of the overlying skin, are usually indicative of a malignant tumor. Multicentricity is also indicative, although not exclusively [8].

Table l. WHO histological classification of salivary gland tumors

| | |
|---|---|
| Adenoma pleomorfo. | Sebáceo. |
| Mioepitelioma. | No sebáceo. |
| Adenoma de células basales. | Papiloma ductal |
| Tumor de *Warthin*. | Papiloma ductal invertido. |
| Oncocitoma. | |
| Adenoma sebáceo. | |
| Linfoadenoma. | |
| **Tumores tejidos blandos** | **Tumores hematolinfáticos** |
| Hemangiomas. | Linfoma de Hodking. |
| | Linfoma difuso de células B grandes. |
| | Linfoma extranodal de zona marginal de células B |
| **Tumores malignos** | |
| Carcinoma de células acinares. | Carcinoma sebáceo. |
| Carcinoma mucoepidermoide. | Linfoadenocarcinoma sebáceo. |
| Carcinoma adenoideo quístico. | Cistoadenocarcinoma. |
| Adenocarcinoma polimorfo de bajo grado. | Cistoadenocarcinoma cribiforme de bajo grado. |
| Carcinoma epitelial mioepitelial. | Adenocarcinoma mucinoso. |
| Carcinoma de células claras. | Carcinoma oncocítico. |
| Adenocarcinoma de células basales. | Carcinoma ductos salivales. |
| Carcinoma mioepitelial. | Carcinoma de células pequeñas/grandes |
| Carcinoma ex adenoma pleomorfo | Carcinosarcoma. |
| Sialoblastoma. | Carcinoma linoepitelial. |

The treatment of choice is parotidectomy. Various surgical techniques have been proposed to treat these tumors, ranging from radical to more conservative techniques, with the aim of achieving complete resection of the tumor mass, with a lower risk of recurrence and a lower rate of associated perioperative complications. Currently, superficial parotidectomy has proven to be an effective technique, with a low recurrence and complication rate, and is the surgery of choice in a large percentage of cases [9].

The essential objective of surgical treatment for patients with PG tumors, and salivary gland tumors in general, is to control the disease and preserve function whenever possible in order to reduce morbidity. This applies especially to patients with malignant tumors, in whom the function of the NF becomes a fundamental issue. The initial treatment of choice for GP tumors (especially malignant ones) is surgery. There are other complementary treatments that can help, in certain situations, to control the locoregional involvement of the disease. Among these is primarily radiotherapy. This is the treatment of choice in some cases [10].

Postoperative facial paralysis, of varying degrees and duration, occurs, according to different authors, as a result of the surgical resection of the PG, and in some series, it is noted that transient postoperative facial weakness can creach up to 80% of cases globally and in varying degrees. A comprehensive and targeted review of the literature on this subject consistently shows figures for postoperative weakness or dysfunction of the facial nerve, transient in nature, ranging from 28% to 60% [11].

Patients affected by total or partial compromise of the seventh cranial nerve (CN. VII) present facial asymmetry due to hypo or atonia of the affected muscles, which causes a negative emotional impact, leading to severe problems in their social interactions and a marked decrease in their quality of life. Facial paralysis also causes recurrent keratitis, corneal ulcers, epiphora, salivary incontinence, accumulation of food in the buccal cavity, abnormal movements, speech difficulties, and lack of expressiveness [12].

In practical and didactic terms, the search for the NF can be classified according to whether or not vital staining of the gland is used. Vital staining with 1% methylene blue is performed by instilling 2 ml or 3 ml of this solution through Stenon's duct prior to the start of the operation. When the gland is sectioned and cut, the dye binds to the lobes, preventing the blue substance from leaking out to stain adjacent tissues. This is a very useful technique that can be used in all cases, as the healthy glandular parenchyma is stained, while the tumor and nerves remain their original color, facilitating their removal and preservation [13].

There are other technical complements that potentially improve the contrast between the facial nerve and the adherent tumor tissue and allow the identification of residual tumor tissue. Sodium fluorescein and the application of a 560 nm yellow filter on the surgical microscope are some of the tools that can be used to identify facial nerve, as well as other techniques that are not guided by staining or vital dyes, such as intraoperative facial nerve monitoring in parotid surgery (neurophysiological and electrophysiological techniques to detect changes in the state of the nervous system during surgery), whose purpose is to assist the surgical team in intraoperative decision-making and reduce the incidence of permanent postoperative neurological damage, with an lower incidence of immediate postoperative injury after parotidectomy in the monitored group compared to the non-monitored group (22.5% vs. 34.9%; P = 0.001) [14,15,16].

1.1 Objective

To evaluate the usefulness of stain-guided parotidectomy in patients with parotid tumors in the Head and Neck Services of the Hospital Oncology Social Security Service (SOH-IVSS) and the Otorhinolaryngologic Service of the "Dr. Carlos Arvelo" Military Hospital (ORL del HMCA) from January 2024 to June 2024.

Secondary objectives: 1. Distribute patients by age, sex, and clinical and histological diagnosis who underwent stain-guided parotidectomy. 2. Characterize lesions according to their location. 3. Indicate the type of surgical procedure to which patients were subjected. 4. To determine the rate of facial nerve identification and parotid parenchyma staining using the stain-guided parotidectomy technique. 5. To evaluate the frequency of complications following parotidectomy and those associated with this staining method.

## 2 Method

A descriptive, prospective study was conducted to determine the usefulness of stain-guided parotidectomy in patients with parotid tumors in the Head and Neck Services of the SOH-IVSS and the Department of Otorhinolaryngology (ENT) of the HMCA, from January 2024 to June 2024. Seventeen (17) patients who met the inclusion criteria represent the sample for this study. Sampling was intentional and non-probabilistic.

2.1 Inclusion criteria

1. Patients diagnosed with parotid tumor. 2. Patients between 18 and 80 years of age. 3. Patients without infection and/or parotid obstruction.

2.2 Exclusion criteria

1. Patients with clinical evidence of facial nerve involvement. 2. Pregnancy. 3. Allergy to methylene blue. 4. Patients with parotid infection and/or obstruction. 5. Patients under 18 and over 80 years of age.

Patients were selected according to the inclusion criteria and after signing the informed consent form. Following standard antisepsis procedures and under general anesthesia, the Stenon's duct is located and canalized, and proceed to dilate the duct using tear duct dilators (Figure 2), then using a plastic catheter (Yelco No.22), instill 3 ml of methylene

blue (Figure 3), and seal the duct around the cannula by applying pressure between the index finger and thumb-one placed intraorally over the duct and the other on the cheek. Methylene blue (2-4 ml) is injected slowly over a period of 20-30 seconds with firm pressure. An increase in resistance is often felt when the duct system is completely filled, with 3 ml being the volume usually required. A cervicoparotid incision is made, starting at the anterior border of the tragus and continuing around the earlobe, curving toward the neck 2 cm below the mandibular border (Figure 4). The flap is elevated in the subplatysmal and capsular plane, facilitated by staining of the gland, without staining the tumor or non-glandular tissues (Figure 5); dissection is performed up to the anterior edge of the gland, then the facial trunk is identified and the nerve branches are dissected. The tumor and parotid tissue lateral to the nerve are dissected and removed; the branches of the facial nerve are preserved (Figure 6). A drain is placed and the flap is sutured in layers [17,18].

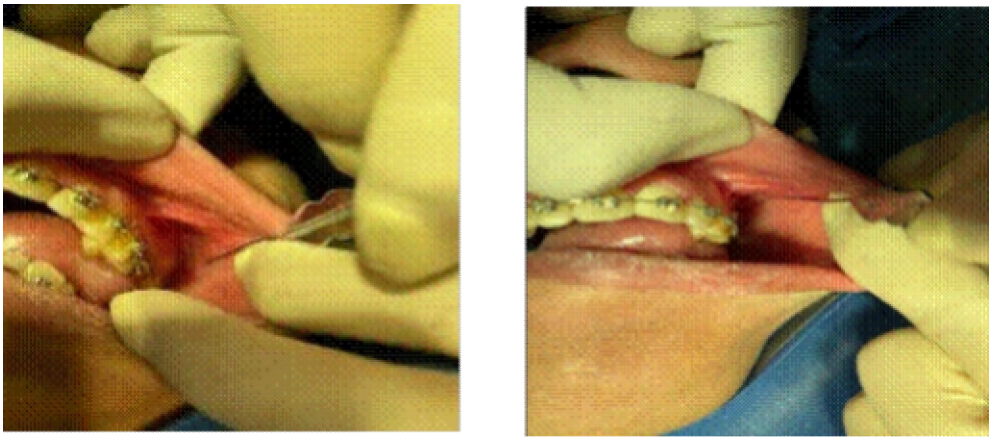

Figure 2. Cannulation of Stenon's duct and dilation with lacrimal duct dilators.

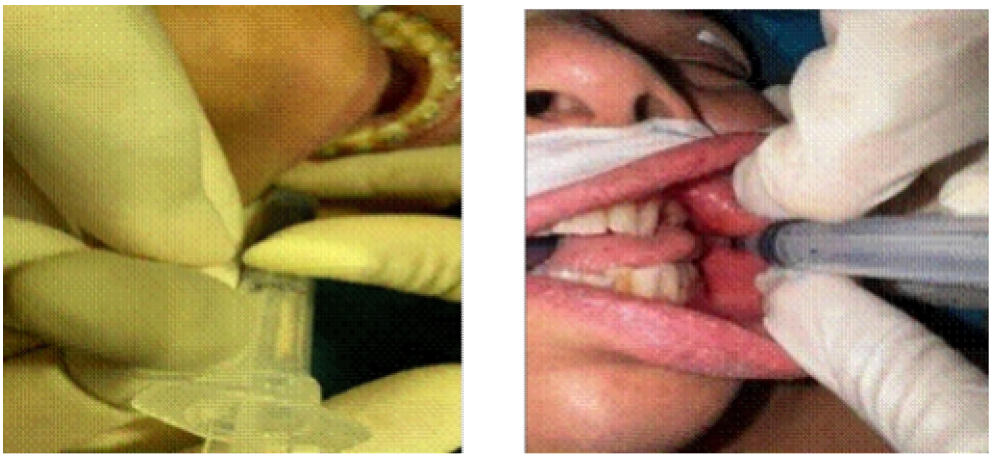

Figure 3. Instillation of 3 $cm^3$ of methylene blue through Stenon's duct

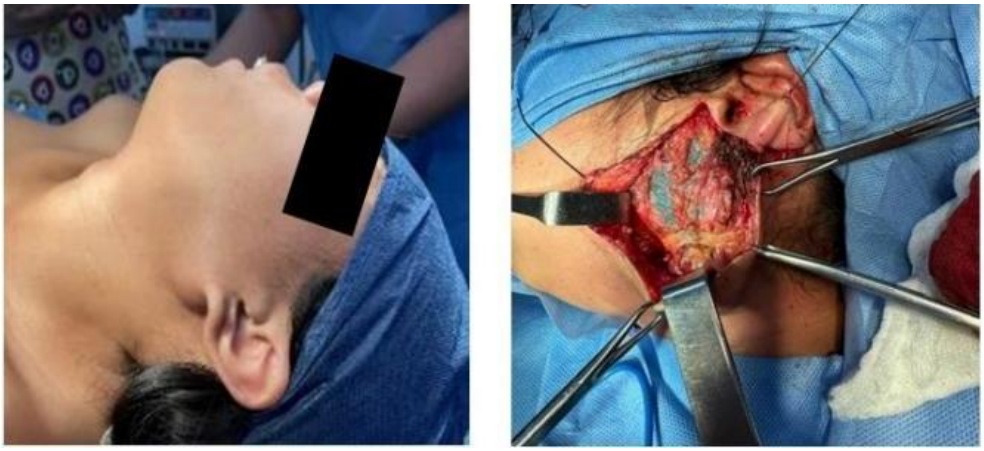

Figure 4. Cervicoparotid incision

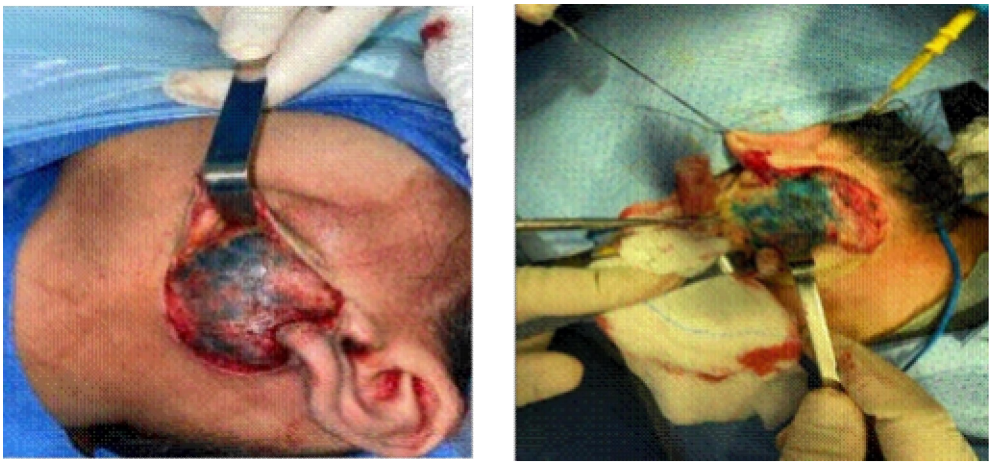

Figure 5. Staining of the gland, without staining the tumor or non-glandular tissues

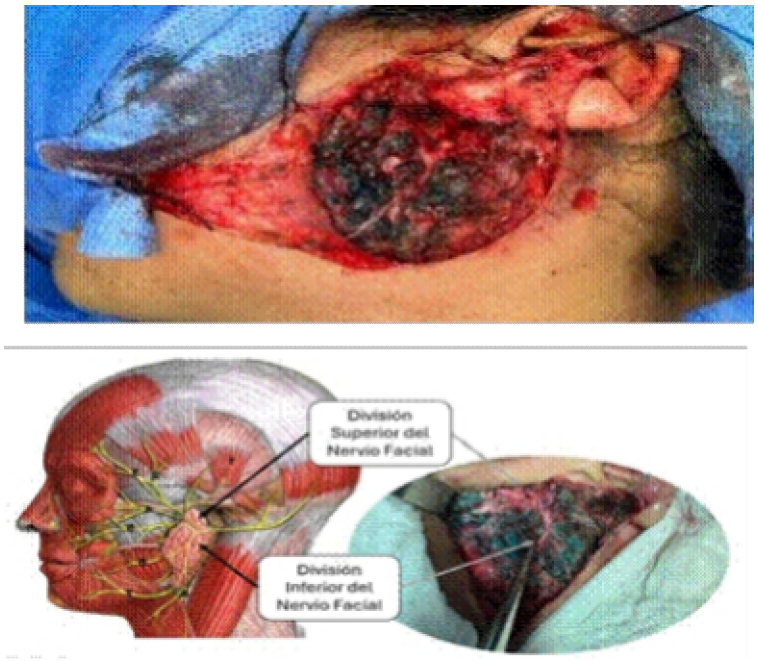


Figure 6. Identification of the facial nerve trunk while preserving its branches

The data obtained were recorded on a collection form, which was used to collect data on the patient's age and sex, histological type, lesions found, and complications that may arise, as well as whether or not facial nerve was identified and whether or not the parotid parenchyma was stained.

2.3 Statistical analysis

The statistical procedure used in the preparation of the tables consisted of tabulation and descriptive analysis of the variables using absolute and relative frequencies, using STATA 17 software. Hypothesis tests were used to evaluate the significance of the differences observed between the various categories of variables. In particular, to evaluate the evolution of the presence of salivary fistula and paresis over time, the McNemar paired test was applied, allowing proportions to be compared at different times and determining significance with a P value $< 0.05$.

## 3 Results

The distribution of patients with parotid tumors according to baseline characteristics showed that the age of the patients was evenly distributed in the ranges of 15 to 30 years, 31 to 45 years, 46 to 60 years, each with 5 patients (29.4% in each group), and 61 to 74 years with 2 patients (11.8%). Females predominated with 14 patients (82.4%). The clinical diagnosis was divided between tumors in the right parotid gland with 8 patients (47.1%) and the left parotid gland with 9 patients (52.9%). According to the histological diagnosis, pleomorphic adenomas were identified in 15 patients (88.2%), carcinoma ex pleomorphic adenoma in 1 patient(5.9%), and high-grade mucoepidermoid carcinoma in 1 patient (5.9%) (Table 2).

Table 2. Distribution of patients with parotid tumors according to baseline characteristics

| Variables | n | % |
|---|---|---|
| **Edad (años)** | | |
| 15-30 | 5 | 29,4 |
| 31-45 | 5 | 29,4 |
| 46-60 | 5 | 29,4 |
| 61-74 | 2 | 29.4 |
| **Sexo** | | |
| Femenino | 14 | 82,4 |
| Masculino | 3 | 17,6 |
| **Diagnóstico clínico** | | |
| Tumor en parótida derecha | 8 | 47,1 |
| Tumor en parótida izquierda | 9 | 52,9 |
| **Diagnóstico histológico** | | |
| Adenoma pleomorfo | 15 | 88,2 |
| Carcinoma ex adenoma pleomorfo | 1 | 5,9 |
| Carcinoma mucoepidermoide de alto grado | 1 | 5,9 |

Different surgical procedures were performed in patients with parotid tumors. Superficial parotidectomy was performed in 15 patients (88.2%) and total parotidectomy with neck dissection in 2 (11.8%). The laterality of the tumors showed a distribution of 8 (47.1%) on the right side and 9 (52.9%) on the left side. Observed complications included facial edema in 4 patients (23.5%), paresis in 3 patients (17.6%) reported as House Brackmann (HB) grade II, transient periauricular dysesthesia in 3 (17.6%), and salivary fistula in 1 (5.9%). No cases of permanent facial paralysis, Frey syndrome, hematomas, or surgical wound dehiscence were reported (Table 3).

Table 3. Distribution of patients with parotid tumors according to clinical-surgical criteria

| Variables | n | % |
|---|---|---|
| **Procedimiento** | | |
| Parotidectomia superficial | 15 | 88,2 |
| Parotidectomia total DCS | 2 | 11,8 |
| **Lateralidad** | | |
| Derecha | 8 | 47,1 |
| Izquierda | 9 | 52,9 |
| **Complicaciones** | | 82,4 |
| Edema fascial | 4 | 17,6 |
| Paresia | 3 | |
| Disestesia peri-auricular transitaria | | 47,1 |
| Fistula saliva | 1 | 52,9 |
| Parálisis | 0 | |
| Sindrome de Frey | 0 | 88,2 |
| Hematomas | 0 | 5,9 |
| Dehiscencia de la herida operatoria | 0 | 5,9 |

The results in Table 4 revealed that, initially, 3 patients (17.6%) had House Brackmann (HB) grade II paresis or salivary fistula, while 14 patients (82.4%) did not have these complications. At 10 days, the same proportion of patients, 3 patients (17.6%), continued to present these complications, and 14 (82.4%) remained without them. At 30, 90, and 180 days, none of the patients presented paresis or salivary fistula; all patients at the end of follow-up were free of these complications. The comparative P values between baseline and 10 days were P = 1.000, while between baseline and 30, 90, and 180 days they were P = 0.083, respectively.

Table 4. Distribution of patients with parotid tumors according to the evolution in the presence of salivary fistula and paresis

| | Controles | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inicio | | 10 dias | | 30 dias | | 90 dias | | 180 dias | |
| Paresia/Fistula salival | n | % | n | % | n | % | n | % | n | % |
| Presente | 3 | 17,6 | 3 | 17,6 | 0,0 | 0,0 | 0 | 0,0 | 0 | 0,0 |
| Ausente | 14 | 82,4 | 14 | 82,4 | 17 | 100,0 | 17 | 100,0 | 17 | 100,0 |

Baseline vs. 10 days: P=1.000; baseline vs. 30 days: P=0.083; baseline vs. 90 days: P=1.083; baseline vs. 180 days: P=1.083.

The results in Table 5 showed that identification of the facial nerve and parenchyma staining were achieved in all

patients (100.0%).

Table 5. Distribution of patients with parotid tumors according to diagnostic outcome

| Resultado diagnóstico | n | % |
|---|---|---|
| Identificación del NF | 17 | 100,0 |
| Tinción del parénquima | 17 | 100,0 |

## 4 Discussion

Salivary gland neoplasms constitute a heterogeneous group of tumors; various series show variations in frequency, location, etiology, and histological types. This study shows the clinical-pathological results found in the analysis, where in most patients, the female sex was the most affected (82.4%), which coincides with most studies, such as that by Rodríguez et al.[19], which shows a higher incidence of these neoplasms in females than in males (54.49% vs. 45.50%, respectively); this is also comparable to the data reported by Vaiman et al.[20], where females predominated over males in both groups: group A 44/26, group B 39/35.

As for the distribution of patients by age group in our study, they were evenly distributed in the ranges of 15-30 years with 5 (29.4%), 31-45 years with 5 (29.4%), 46-60 years with 5 (29.4%), and 61-74 years with 2 (11.8%), that is, the distribution was almost uniform between the third and fifth decades of life, with a decrease in incidence after 60 years of age. Vaiman et al.[20] report a mean age between 38 and 43 years for both groups, as reported in the study by Callero H et al.[17], where the average age of patients treated for glandular tumors was 52 years, ranging from 20 to 78 years.

Tapia et al.[20] in their study report data comparable to this study, with an age range between 17 and 85 years. Of the 70 patients in their study, 44 were female (62.9%) with an average age of 54 years and 26 were male (37.1%) with an average age of 49.7 years [21].

Regarding the laterality of the tumors, the studies consulted do not refer to a predominance of involvement of the right or left parotid gland. However, data that were recorded in this study, where involvement of the right parotid gland was 47.1% in contrast to the left with 52.9%.

Approximately 80% of major salivary gland tumors are benign, but in minor salivary glands, between 35% and 80% are malignant and vary greatly in clinical and histopathological presentation. Pleomorphic adenoma is the most common benign tumor of the salivary glands. It can undergo malignant transformation and metastasize to other distant organs. Pleomorphic adenoma is also known as a benign mixed tumor, derived from a mixture of ductal and myoepithelial elements, which accounts for 80% of all benign masses of this gland. In our study, based on histological diagnosis, pleomorphic adenomas were identified in 15 patients (88.2%), carcinoma ex pleomorphic adenoma in 1 (5.9%), and high-grade mucoepidermoid carcinoma in 1 (5.9%). These data are similar to the frequency found in the literature, where pleomorphic adenoma represents the predominant histological type [22,23].

Treatment for salivary gland neoplasms must be individualized for each patient, much more so than for other

neoplasms; for this reason, experience in management is very important. Superficial parotidectomy with preservation of the facial nerve was the therapeutic treatment for most patients in our study (15 patients, 88.2%), and total parotidectomy with neck dissection in 2 patients (11.8%). These data are similar to those reported in the study by Vaiman et al.[20], where superficial parotidectomy predominated in both groups (A-B) in 35 and 37 patients, respectively, compared to total parotidectomy performed in 4 and 9 patients in each group. These data are also comparable to the work of Aguirre A et al.[24], where superficial parotidectomy was performed in 47 patients and total parotidectomy with neck dissection in 2 patients. Other studies confirm data with the same surgical trend, such as the work of Tapia et al.[21], who reported superficial and total parotidectomy in 86% and 14% of cases, respectively.

Tapia et al.[21] report that the incidence of transient facial paresis or paralysis was 16.1% (10 patients), all classified as partial House Brackmann (HB) grade II to III. Of these, only one patient (1.4%) had HB II facial paresis of the corner of the mouth for more than six months. Transient complications also included one case of seroma, three hematomas in the surgical area, one surgical wound dehiscence, and one case of periauricular dysesthesia (14%), all of which resolved within six months. Of the 70 patients with primary parotid tumors included in this study, two patients (2.9%) had Frey syndrome as a complication; these data are comparable to those obtained in this study, where the complications observed were House Brackmann (HB) II paresis in 3 patients (17.6%), a complication that lasted for approximately two weeks, and transient periauricular dysesthesia in 3 patients (17.6%), in contrast to 14% in the study by Tapia et al.[21]. In our experience, salivary fistula was observed in 1 case (5.9%) and facial edema in 4 patients (23.5%), in contrast to the study by Vaiman et al.[20], the only study that reports facial edema among its complications in 5.5% of cases. No cases of permanent paralysis, Frey syndrome, hematomas, or surgical wound dehiscence were reported, as in most studies.

As in the studies by Nahlieliv O et al.[25] and Catania V et al.[26], parotid parenchyma staining and facial nerve identification were achieved in all cases, as in our study, where both parenchyma staining and nerve identification were achieved in 100% of cases.

In conclusion, a successful GP operation is one in which the entire tumor is resected with clean margins and the facial nerve is preserved. The use of methylene blue can help achieve these goals. The edges of the tumor are more clearly visible because only normal glandular tissue is stained. Methylene blue staining also helps to achieve a total parotidectomy and reduces the use of the facial nerve stimulator during surgery, which is not without risks. It can also be used during dissection to help the surgeon more clearly identify the plane between the parotid capsule and the subcutaneous adipose tissue, allowing the flap to be dissected more safely and quickly, thus saving surgery time [18].

The integration of methylene blue as an intravital staining agent in parotid surgery has shown promising potential for mitigating surgical morbidity and improving patient outcomes. Numerous studies have explored the benefits of this innovative approach, shedding light on its impact on various aspects of surgical precision and patient care: 1. Better identification and preservation of the facial nerve, more precise and less manipulation of nerve structures, which in turn contributes to reducing the risk of nerve injury and consequent temporary facial weakness. 2. Reduction in temporary facial weakness: studies exploring stain-assisted surgery have reported a reduction in the occurrence of this complication. 3. Improved tumor resection margins, allowing surgeons to more accurately assess the relationships between tumors and adjacent tissues [27].

Surgical success rates and future directions: studies evaluating the outcomes of methylene blue-assisted parotid surgery have reported favorable surgical success rates. The potential of this technique to reduce surgical morbidity, improve surgical precision, and increase patient satisfaction makes it a valuable addition to the arsenal of parotid surgeons. As the use of this technique in parotid surgery gains traction, future directions include refining staining protocols,

optimizing dosing strategies, and integrating this technique with emerging technologies. Ongoing research and advances in this field promise to further improve the application and outcomes of stain-guided parotid surgery [27].

It is important to highlight the impact of parotid surgery on the patient's quality of life. One of the most significant repercussions of stain-assisted parotid surgery is on the quality of life of patients. The reduction in surgical complications, such as temporary facial weakness and permanent nerve damage, directly translates into an improvement in the patient's experience and psychological well-being. Patients are likely to experience fewer functional disorders and aesthetic changes, contributing to greater overall satisfaction and psychosocial adaptation [28].

Finally, we plan to analyze survival and disease-free periods using this technique in the future, retrospectively comparing the data found in this study with data from patients who underwent parotid gland surgery not guided by staining, and comparing both complication rates, as well as to continue this study over time in both institutions to first validate and then evaluate the possibility of standardizing this procedure as the gold standard in these centers.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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