IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 9 Ser. 10 (September. 2024), PP 46-52
www.iosrjournals.org

Outcome And Complications Of Superficial Parotidectomy In Benign Parotid Tumor

Mohammad Anwar Hossain, Arif Mahmud Jewel, Tawfiqur Rahman

Assistant Professor, Department Of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Assistant Professor, Department Of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Assistant Professor, Department Of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Abstract

Background*: Benign parotid tumors are relatively common in middle-aged individuals, and superficial parotidectomy is a widely accepted treatment. However, postoperative complications, including facial nerve palsy and Frey's syndrome, remain concerns. This study aimed to evaluate the demographic distribution, tumor characteristics, surgical outcomes, and patient satisfaction following superficial parotidectomy for benign parotid tumors.*

Methods*: This retrospective cross-sectional study reviewed the medical records of 80 patients who underwent superficial parotidectomy for benign parotid tumors. Data collected included demographic characteristics, tumor pathology, surgical details, and postoperative outcomes. The primary outcomes measured were postoperative complications, including facial nerve palsy, Frey's syndrome, and tumor recurrence. Secondary outcomes included patient satisfaction and long-term complications.*

Results*: The majority of patients (63.75%) were aged 40-60 years, and 77.50% of tumors were pleomorphic adenomas. Postoperative facial nerve palsy was observed in 47.50% of patients, with 45.00% experiencing mild weakness and 1.25% moderate weakness. Only 1.25% of patients had permanent facial nerve palsy. Frey's syndrome occurred in 11.25% of patients, while tumor recurrence was noted in 3.75%. Despite these complications, 56.25% of patients reported being satisfied or very satisfied with the surgical outcome.*

Conclusion*: Superficial parotidectomy remains an effective treatment for benign parotid tumors, though significant postoperative complications, such as facial nerve palsy and Frey's syndrome, warrant further refinement of surgical techniques. Patient satisfaction is generally favorable, but ongoing improvements in postoperative care are essential for optimizing outcomes.*

Keywords: *Superficial parotidectomy, benign parotid tumors, postoperative complications, facial nerve palsy, Frey's syndrome.*

Date of Submission: 17-09-2024 Date of Acceptance: 27-09-2024

I. Introduction

The parotid glands are the largest paired aggregates of salivary tissue in the body. While the acinar, ductal, and myoepithelial cells that compose parotid tissue can give rise to a diverse array of benign and malignant neoplasms, these cells function primarily to create and discharge serous saliva through a relatively simple glandular structure. Most parotid tumors are benign and typically present as painless, slow-growing lumps (1). Approximately 3% of head and neck tumors are parotid gland tumors, of which 80% are benign. Parotid surgery is indicated for benign tumors, such as basal cell adenoma, cystadenolymphoma, and pleomorphic salivary adenoma (2,3). The goal of parotid surgery is to remove the gland either partially or entirely while preserving facial nerve function and preventing tumor recurrence (4). Various surgical techniques are employed to treat benign parotid tumors, including extracapsular dissection (ECD), partial lateral (superficial) parotidectomy, lateral or superficial parotidectomy (SP), and total parotidectomy with facial nerve preservation (5). In the 1950s, Martin et al. introduced the concept of superficial parotidectomy (SP) using the facial nerve as an anatomical landmark. Over time, this procedure became the standard practice for treating benign parotid tumors (6,7). Despite reducing cancer recurrence rates to around 2%, SP is associated with complications such as facial nerve palsy and

aesthetic concerns for the patient (8). The total documented complication rate following parotidectomy is 21.6% (9). Quality of life (QoL) is often negatively impacted by complications such as oral dryness, discomfort, Frey's syndrome, postoperative numbness, and scar-related issues (10). To mitigate aesthetic and functional challenges following the resection of benign parotid tumors, the superficial musculoaponeurotic system (SMAS) flap is used for parotid lodge reconstruction (11). Advances in medical technology and a growing emphasis on maintaining both the functional and aesthetic integrity of the gland have led to the development and adoption of partial superficial parotidectomy (PSP) (12). PSP differs from SP in that it involves a smaller resection area, thus better preserving the gland's secretory function and facial aesthetics. However, complications such as Frey's syndrome, facial nerve palsy, and tumor recurrence have still been documented in PSP cases (12,13). Facial nerve damage following parotidectomy can be attributed to several factors, including nerve division, stretching, compression, ligature entrapment, thermal injury, electrical trauma, and ischemia (14). Additional complications of parotid surgery include hemorrhage, hematoma, seroma, sialocele, salivary fistula, infection, keloid formation, and Frey's syndrome (15). Temporary facial nerve paresis, which may affect one or multiple branches of the nerve, as well as permanent facial paralysis, has been observed, with rates ranging from 0% to 8% (16). Although Frey's syndrome is notoriously difficult to treat, preventive measures can be taken (17). Other cosmetic complications, such as keloid formation and hypertrophic scars, may require steroid injections for correction (18). While it is generally agreed that the extent of parotidectomy influences the risk of postoperative complications, there is insufficient data to definitively support this claim (19).

II. Methods

The retrospective cross-sectional study was conducted from July, 2019 to June 2024 at Department of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka focusing on patients who underwent superficial parotidectomy for benign parotid tumors. Medical records of patients were reviewed, and data were collected on demographics, clinical presentation, surgical approach, histopathological diagnosis, and postoperative outcomes. The primary outcomes measured included the rate of postoperative complications such as facial nerve weakness, Frey's syndrome, hematoma, seroma, infection, and recurrence of the tumor. Secondary outcomes evaluated were the duration of surgery, hospital stay, and patients' satisfaction. Inclusion criteria for the study encompassed patients aged 18 years and older who had a confirmed diagnosis of benign parotid tumors and had undergone superficial parotidectomy. Patients with complete medical records documenting preoperative imaging, histopathological confirmation, and follow-up data were included. Exclusion criteria were patients with malignant parotid tumors, incomplete medical records, prior parotid surgery, or concurrent surgeries involving other structures of the head and neck. Data were analyzed using SPSS version 26. Ethical approval was obtained from the institutional review board, and patient confidentiality was maintained throughout the study.

III. Results

Table 1: Distribution of Study Population Based on Basic Characteristics (n=80)

Basic Characteristics	n	%
Age		
<40	27	33.75%
40-60	51	63.75%
>60	2	2.50%
Gender		
Male	38	47.50%
Female	42	52.50%
Residence		
Urban	16	20.00%
Rural	64	80.00%
Occupation		
Employed	4	5.00%
Unemployed	35	43.75%
Student	4	5.00%
Other-Business/Housewife	37	46.25%
Family history of parotid tumours		
Yes	6	7.50%
No	74	92.50%

The majority of the participants (63.75%) were between the ages of 40 and 60, with a smaller proportion under 40 years old (33.75%) and only 2.50% above 60 years. Female participants slightly outnumbered males,

representing 52.50% of the population compared to 47.50% male. Most of the patients (80.00%) resided in rural areas, while only 20.00% were from urban locations. Regarding occupation, 46.25% of the participants were categorized as either business owners or housewives, while 43.75% were unemployed. A small percentage were employed (5.00%) or students (5.00%). Additionally, a family history of parotid tumors was reported in only 7.50% of cases, with the vast majority (92.50%) having no family history of the condition.

Table 2: Distribution of Study Population Based on Tumor Characteristics(n=80)

Tumor Characteristics	n	%
Tumor Location		
Right Parotid Gland	48	60.00%
Left Parotid Gland	32	40.00%
Tumor Size		
<2 cm	0	0.00%
2-6cm	62	77.50%
>6 cm	18	22.50%
Mean±SD	4.44±1.24	
Pathological Type		
Pleomorphic Adenoma	62	77.50%
Warthin's Tumor	9	11.25%
Other	9	11.25%
Duration of symptoms Before Surgery (in months)		
Mean±SD	67 ±8.96 months	
Preoperative Findings (Facial Nerve)		
Normal	80	100.00%
Mild Weakness	0	0.00%
Moderate Weakness	0	0.00%
Severe Weakness	0	0.00%

The tumor characteristics of the study population revealed that 60.00% of the tumors were located in the right parotid gland, while 40.00% were in the left parotid gland. The majority of tumors (77.50%) were between 2 and 6 cm in size, with 22.50% exceeding 6 cm in diameter, and no tumors were smaller than 2 cm. The mean tumor size was 4.44 cm with a standard deviation of 1.24 cm. In terms of pathological type, pleomorphic adenoma was the most common, accounting for 77.50% of the cases, followed by Warthin's tumor (11.25%). Other tumor types, including basal cell adenoma, oncocytoma, sebaceous adenoma, lymphangioma, and hemangioma, made up the remaining 11.25%. The mean duration of symptoms before surgery was 67 months, with a standard deviation of 8.96 months. Preoperative findings showed that all patients (100.00%) had normal facial nerve function, with no reported cases of mild, moderate, or severe weakness before surgery.

Table 3: Distribution of Study Population Based on Surgical Details (n=80)

Surgical Details	n	%
Type of Anaesthesia		
General Anaesthesia	80	100.00%
Local Anaesthesia	0	0.00%
Surgical Technique Used		
Conventional Superficial Parotidectomy	80	100.00%
Minimally Invasive Superficial Parotidectomy	0	0.00%
Intraoperative Findings		
Adherence to Surrounding Tissues	13	16.25%
Not adherence to Surrounding Tissues	67	83.75%
Duration of Surgery (in hours|)		
Mean±SD	2.13±0.88 hours	
Intraoperative Complications		

None	59	73.75%
Excessive Bleeding	21	26.25%
Nerve Injury	0	0.00%
Other	0	0.00%

In terms of surgical details, all patients (100.00%) underwent superficial parotidectomy under general anesthesia, with no cases performed under local anesthesia. The conventional superficial parotidectomy technique was used in all surgeries, with no minimally invasive approaches reported. Intraoperatively, adherence of the tumor to surrounding tissues was observed in 16.25% of the cases, while intraoperative nerve monitoring was not utilized in any of the procedures. Additionally, 2.50% of patients had other intraoperative findings. The mean duration of surgery was 2.13 hours, with a standard deviation of 0.88 hours. Most patients (73.75%) experienced no intraoperative complications; however, 26.25% encountered excessive bleeding, though there were no reports of nerve injury or other complications during the surgeries.

Table 4: Distribution of Study Population Based on |Postoperative Outcomes (n=80)

Postoperative Outcomes	n	%
Length of Hospital Stay (in days)		
≤7 Days	73	91.25%
>7 Days	7	8.75%
Postoperative Facial Nerve Function		
Normal	43	53.75%
Mild weakness	36	45.00%
Moderate Weakness	1	1.25%
Severe Weakness	0	0.00%
Postoperative Complications		
Hematoma	5	6.25%
Seroma	3	3.75%
Infection	3	3.75%
Frey's Syndrome	9	11.25%
Facial Nerve Palsy	38	47.50%
Wound Dehiscence	1	1.25%
Duration of drainage (in days)		
Mean±SD	2.73 ±1.27 days	
Histological Confirmation		
Benign	80	100.00%
Malignant	0	0.00%

In terms of postoperative outcomes, the majority of patients (91.25%) had a hospital stay of 7 days or less, with only 8.75% staying longer than 7 days. Postoperative facial nerve function was normal in 53.75% of patients, while 45.00% experienced mild weakness and 1.25% had moderate weakness; no cases of severe weakness were observed. Regarding complications, Frey's syndrome was present in 11.25% of patients, while facial nerve palsy affected 47.50%. Other complications included hematoma (6.25%), seroma (3.75%), infection (3.75%), wound dehiscence (1.25%). All tumors were histologically confirmed as benign.

Table 5: Distribution of Study Population Based on Follow-up within 1-5 years (n=80)

Follow-up Data	n	%
Recurrence		
Yes	3	3.75%
No	77	96.25%
Long-Term Complications		
Persistent Facial Nerve Palsy	1	1.25%
Chronic Pain	6	7.50%
Frey's Syndrome	9	11.25%

Cosmetic Deformity	31	38.75%
Patient Satisfaction with Outcome		
Very Satisfied	11	13.75%
Satisfied	34	42.50%
Neutral	17	21.25%
Unsatisfied	17	21.25%
Very unsatisfied	1	1.25%

Within 1 year to 5 year follow up, 3.75% of patients experienced tumor recurrence, while 96.25% had no recurrence. Long-term complications included persistent facial nerve palsy in 1.25% of patients, chronic pain in 7.50%, Frey's syndrome in 11.25%, and cosmetic deformity in 38.75%. In terms of patient satisfaction with the surgical outcome, 13.75% of patients were very satisfied, 42.50% were satisfied, and 21.25% remained neutral. However, 21.25% of patients reported being unsatisfied, and 1.25% were very unsatisfied with the outcome.

IV. Discussion

The findings of this study align with existing literature on benign parotid tumors, specifically regarding demographic characteristics, tumor pathology, and postoperative outcomes. The majority of our study population was aged between 40 and 60 years, with a slightly higher proportion of females (52.50%) compared to males. This is consistent with previous studies, which indicate that benign parotid tumors are more common in middle-aged adults, particularly among women. A similar age and gender distribution was reported by Kara et al., who found a predominance of benign salivary tumors in females and middle-aged individuals (20). The significant majority of patients in this study (80%) resided in rural areas, which contrasts with findings from studies conducted in more urbanized settings, suggesting that regional factors may influence the demographic distribution of parotid tumors (21). In terms of tumor characteristics, pleomorphic adenoma accounted for 77.50% of the cases, followed by Warthin's tumor (11.25%), which is in line with global trends reported in multiple studies. For example, Ghaderi et al. also found pleomorphic adenoma to be the most prevalent benign tumor, with similar proportions (22). Tumors were predominantly located in the right parotid gland, which is also a recurring observation in the literature, though the underlying reasons for this asymmetry remain unclear (23,24). Furthermore, our study found that 77.50% of tumors were between 2 and 6 cm in size, which reflects findings in other studies where medium-sized tumors were most common (25). Regarding intraoperative and postoperative complications, 16.25% of patients experienced adherence of the tumor to surrounding tissues, and 26.25% experienced excessive bleeding, though no nerve injuries were reported. This is consistent with the study by Guntinas-Lichius et al., which found a low rate of permanent facial nerve palsy but significant risks associated with tissue adherence and intraoperative complications (25). Postoperatively, facial nerve function was normal in 53.75% of patients, with 45.00% experiencing mild weakness and only 1.25% experiencing moderate weakness. These figures are consistent with those reported by Al-Aroomi et al., who found a higher incidence of temporary nerve weakness in patients undergoing conventional superficial parotidectomy compared to partial parotidectomy (26). The most common postoperative complications in our study were facial nerve palsy (47.50%), Frey's syndrome (13.75%), hematoma (6.25%), and seroma (3.75%). The incidence of Frey's syndrome in our study aligns with that of other research, such as the 14.1% incidence reported by Ozturk et al., though higher than the 4% noted by Guntinas-Lichius et al. (23,25). This variation might be attributed to differences in surgical techniques, patient demographics, and the use of preventive measures, such as SMAS flaps, which have been shown to reduce the incidence of Frey's syndrome (27). Hematoma and seroma rates in our study were comparable to those in similar studies, though our infection rate (3.75%) was lower than the rates reported by some others (28). Long-term complications included persistent facial nerve palsy (1.25%), chronic pain (7.50%), and Frey's syndrome (11.25%). These rates are within the range reported in the literature. For instance, a study by Henney et al. observed that Frey's syndrome often develops within the first year following surgery, while persistent facial nerve palsy remains a relatively rare outcome (29). Chronic pain, reported in 7.50% of our patients, is a significant concern in post-parotidectomy patients, as noted in studies like satisfaction by reducing the incidence of complications such as Frey's syndrome and improving cosmetic outcomes (31). This suggests that more advanced surgical techniques and postoperative care could improve patient satisfaction in our cohort.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

V. Conclusion

The findings of this study highlight the demographic characteristics, tumor pathology, and postoperative outcomes of patients undergoing superficial parotidectomy for benign parotid tumors. The results demonstrate that the majority of tumors were pleomorphic adenomas occurring in middle-aged patients, with a significant incidence of postoperative complications such as temporary facial nerve palsy and Frey's syndrome. Despite these complications, patient satisfaction remained relatively high, emphasizing the effectiveness of superficial parotidectomy as a treatment for benign parotid tumors. However, ongoing efforts to improve surgical techniques, minimize complications, and enhance cosmetic and functional outcomes are warranted. Long-term follow-up and personalized surgical approaches will help optimize treatment outcomes and patient satisfaction.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

References

[1] Spiro RH. Salivary Neoplasms: Overview Of A 35-Year Experience With 2,807 Patients. Head & Neck Surgery [Internet]. 1986 [Cited 2024 Sep 9];8(3):177–84. Available From: Https://Onlinelibrary.Wiley.Com/Doi/Abs/10.1002/Hed.2890080309

[2] Bradley PJ. Pleomorphic Salivary Adenoma Of The Parotid Gland: Which Operation To Perform? Current Opinion In Otolaryngology & Head And Neck Surgery [Internet]. 2004 Apr [Cited 2024 Sep 9];12(2):69. Available From: Https://Journals.Lww.Com/Co-Otolaryngology/Citation/2004/04000/Pleomorphic_Salivary_Adenoma_Of_The_Parotid_Gland_.2.Aspx

[3] Berretti G, Colletti G, Parrinello G, Iavarone A, Vannucchi P, Deganello A. Pilot Study On Microvascular Anastomosis: Performance And Future Educational Prospects. Acta Otorhinolaryngol Ital [Internet]. 2018 Aug [Cited 2024 Sep 9];38(4):304–9. Available From: Https://Www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/PMC6146574/

[4] Gunsoy B, Vuralkan E, Sonbay ND, Simsek G, Tokgoz SA, Akin I. Quality Of Life Following Surgical Treatment Of Benign Parotid Disease. Indian J Otolaryngol Head Neck Surg [Internet]. 2013 Jul 1 [Cited 2024 Sep 9];65(1):105–11. Available From: Https://Doi.Org/10.1007/S12070-012-0585-7

[5] Quer M, Vander Poorten V, Takes RP, Silver CE, Boedeker CC, De Bree R, Et Al. Surgical Options In Benign Parotid Tumors: A Proposal For Classification. Eur Arch Otorhinolaryngol [Internet]. 2017 Nov 1 [Cited 2024 Sep 9];274(11):3825–36. Available From: Https://Doi.Org/10.1007/S00405-017-4650-4

[6] Norman JE Deburgh, Mcgurk M. Color Atlas And Text Of The Salivary Glands: Diseases, Disorders And Surgery. (No Title). 1995;

[7] Foresta E, Torroni A, Di Nardo F, De Waure C, Poscia A, Gasparini G, Et Al. Pleomorphic Adenoma And Benign Parotid Tumors: Extracapsular Dissection Vs Superficial Parotidectomy—Review Of Literature And Meta-Analysis. Oral Surgery, Oral Medicine, Oral Pathology And Oral Radiology [Internet]. 2014 Jun 1 [Cited 2024 Sep 9];117(6):663–76. Available From: Https://Www.Sciencedirect.Com/Science/Article/Pii/S2212440314003174

[8] Albergotti WG, Nguyen SA, Zenk J, Gillespie MB. Extracapsular Dissection For Benign Parotid Tumors: A Meta-Analysis. The Laryngoscope [Internet]. 2012 [Cited 2024 Sep 9];122(9):1954–60. Available From: Https://Onlinelibrary.Wiley.Com/Doi/Abs/10.1002/Lary.23396

[9] Kilavuz AE, Songu M, Pinar E, Ozkul Y, Ozturkcan S, Aladag I. Superficial Parotidectomy Versus Partial Superficial Parotidectomy: A Comparison Of Complication Rates, Operative Time, And Hospital Stay. Journal Of Oral And Maxillofacial Surgery [Internet]. 2018 Sep 1 [Cited 2024 Sep 9];76(9):2027–32. Available From: Https://Www.Sciencedirect.Com/Science/Article/Pii/S0278239118303033

[10] Ciuman RR, Oels W, Jaussi R, Dost P. Outcome, General, And Symptom-Specific Quality Of Life After Various Types Of Parotid Resection. The Laryngoscope [Internet]. 2012 [Cited 2024 Sep 9];122(6):1254–61. Available From: Https://Onlinelibrary.Wiley.Com/Doi/Abs/10.1002/Lary.23318

[11] DELL'AVERSANA ORABONA G, SALZANO G, ABBATE V, PIOMBINO P, ASTARITA F, IACONETTA G, Et Al. Use Of The SMAS Flap For Reconstruction Of The Parotid Lodge. Acta Otorhinolaryngol Ital [Internet]. 2015 Dec [Cited 2024 Sep 9];35(6):406–11. Available From: Https://Www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/PMC4755052/

[12] Quer M, Guntinas-Lichius O, Marchal F, Vander Poorten V, Chevalier D, León X, Et Al. Classification Of Parotidectomies: A Proposal Of The European Salivary Gland Society. Eur Arch Otorhinolaryngol [Internet]. 2016 Oct 1 [Cited 2024 Sep 9];273(10):3307–12. Available From: Https://Doi.Org/10.1007/S00405-016-3916-6

[13] Lu HB, Ma WN, Yu H, Sun L, Guo XL. [Retrospective Study Of Partial Superficial Parotidectomy And Superficial Parotidectomy On Superficial Parotid Benign Tumor]. Lin Chuang Er Bi Yan Hou Tou Jing Wai Ke Za Zhi [Internet]. 2017 Jun 1 [Cited 2024 Sep 9];31(12):901–5. Available From: Https://Doi.Org/10.13201/J.Issn.1001-1781.2017.12.002

[14] Fareed M, Mowaphy K, Abdallah H, Mostafa M. Temporary Facial Nerve Paralysis After Parotidectomy: The Mansoura Experience, A Prospective Study. The Egyptian Journal Of Surgery [Internet]. 2014 Jun [Cited 2024 Sep 9];33(2):117. Available From: Https://Journals.Lww.Com/Ejos/Fulltext/2014/33020/Temporary_Facial_Nerve_Paralysis_After.8.Aspx

[15] Mutlu V, Kaya Z. Which Surgical Method Is Superior For The Treatment Of Parotid Tumor? Is It Classical? Is It New? Eurasian J Med [Internet]. 2019 Oct [Cited 2024 Sep 9];51(3):273–6. Available From: Https://Www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/PMC6812910/

[16] Biswas AK, Akhtar N, Debnath TK, Sarkar A, Salam KS. Complications Of Parotid Surgery A Study Of 30 Cases. Bangladesh J Of Otorhinolaryngology [Internet]. 2015 Jul 27 [Cited 2024 Sep 9];21(1):23–7. Available From: Https://Www.Banglajol.Info/Index.Php/BJO/Article/View/24292

[17] Venkatesh S, Srinivas T, Hariprasad S. Parotid Gland Tumors: 2-Year Prospective Clinicopathological Study. Annals Of Maxillofacial Surgery [Internet]. 2019 Jun [Cited 2024 Sep 9];9(1):103. Available From: Https://Journals.Lww.Com/Aoms/Fulltext/2019/09010/Parotid_Gland_Tumors__2_Year_Prospective.16.Aspx

[18] Bovenzi CD, Ciolek P, Crippen M, Curry JM, Krein H, Heffelfinger R. Reconstructive Trends And Complications Following Parotidectomy: Incidence And Predictors In 11,057 Cases. Journal Of Otolaryngology - Head & Neck Surgery [Internet]. 2019 Jan 1 [Cited 2024 Sep 9];48(1):64. Available From: Https://Doi.Org/10.1186/S40463-019-0387-Y

[19] Liu HT, Jiang WP, Xia G, Liao JM. Evaluation Of The Effectiveness Of Superficial Parotidectomy And Partial Superficial Parotidectomy For Benign Parotid Tumours: A Meta-Analysis. Journal Of Otolaryngology - Head & Neck Surgery [Internet]. 2023 Jan 1 [Cited 2024 Sep 9];52(1):S40463-023-00679-W. Available From: Https://Doi.Org/10.1186/S40463-023-00679-W

[20] Kara MI, Göze F, Ezirganli S, Polat S, Muderris S, Elagoz S. Neoplasms Of The Salivary Glands In A Turkish Adult Population. Med Oral Patol Oral Cir Bucal. 2010 Nov 1;15(6):E880-885.

[21] Ghaderi H, Kruger E, Ahmadvand S, Mohammadi Y, Khademi B, Ghaderi A. Epidemiological Profile Of Salivary Gland Tumors In Southern Iranian Population: A Retrospective Study Of 405 Cases. J Cancer Epidemiol. 2023;2023:8844535.

[22] Franzen AM, Kaup Franzen C, Guenzel T, Lieder A. Increased Incidence Of Warthin Tumours Of The Parotid Gland: A 42-Year Evaluation. Eur Arch Otorhinolaryngol. 2018 Oct;275(10):2593–8.

[23] Ozturk K, Ozturk A, Turhal G, Kaya I, Akyildiz S, Uluoz U. Comparative Outcomes Of Extracapsular Dissection And Superficial Parotidectomy. Acta Oto-Laryngologica [Internet]. 2019 Dec 2 [Cited 2024 Sep 9];139(12):1128–32. Available From: Https://Doi.Org/10.1080/00016489.2019.1669821

[24] Kadletz L, Grasl S, Grasl MC, Perisanidis C, Erovic BM. Extracapsular Dissection Versus Superficial Parotidectomy In Benign Parotid Gland Tumors: The Vienna Medical School Experience. Head Neck. 2017 Feb;39(2):356–60.

[25] Guntinas-Lichius O, Gabriel B, Klussmann JP. Risk Of Facial Palsy And Severe Frey's Syndrome After Conservative Parotidectomy For Benign Disease: Analysis Of 610 Operations. Acta Otolaryngol. 2006 Oct;126(10):1104–9.

[26] Al-Aroomi MA, Mashrah MA, Abotaleb BM, Sun J, Al-Worafi NA, Huang Y, Et Al. Comparison Of Postoperative Complications And Facial Nerve Recovery Rates After Conventional And Partial Superficial Parotidectomy Of Benign Parotid Tumours: A Prospective Study. International Journal Of Oral And Maxillofacial Surgery [Internet]. 2021 Mar 1 [Cited 2024 Sep 9];50(3):335–40. Available From: Https://Www.Sciencedirect.Com/Science/Article/Pii/S0901502720302988

[27] Bayır Ö, Çelik EK, Saylam G, Tatar EÇ, Saka C, Dağlı M, Et Al. The Effects Of Superficial Musculoaponeurotic System Flap On The Development Of Frey's Syndrome And Cosmetic Outcomes After Superficial Parotidectomy. Turk Arch Otorhinolaryngol [Internet]. 2016 Dec [Cited 2024 Sep 9];54(4):158–64. Available From: Https://Www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/PMC5782955/

[28] Giannone N, Lo Muzio L, Politi M. Extracapsular Lumpectomy And SMAS Flap For Benign Parotid Tumours: An Early Outcome In A Small Number Of Cases On Frey's Syndrome And Facial Nerve Dysfunction. J Craniomaxillofac Surg. 2008 Jun;36(4):239–43.

[29] Henney SE, Brown R, Phillips DE. Parotidectomy: The Timing Of Post-Operative Complications. Eur Arch Otorhinolaryngol. 2010 Jan;267(1):131–5.

[30] Fiacchini G, Cerchiai N, Tricò D, Sellari-Franceschini S, Casani AP, Dallan I, Et Al. Frey Syndrome, First Bite Syndrome, Great Auricular Nerve Morbidity, And Quality Of Life Following Parotidectomy. Eur Arch Otorhinolaryngol. 2018 Jul;275(7):1893–902.

[31] Baum SH, Pförtner R, Ladwein F, Schmeling C, Rieger G, Mohr C. Use Of Dermis-Fat Grafts In The Prevention Of Frey's Syndrome After Parotidectomy. J Craniomaxillofac Surg. 2016 Mar;44(3):301–8.