

## A Retrospective Study on Iraqi Patients to Evaluate the Results of Parotidectomy in the Ear, Nose, and Throat Department

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**Abstract: Background:** A parotid gland is a large salivary gland positioned just in front of the ears as well as under the cheekbones. Parotid tumors constitute nearly ninety percent for salivary gland tumors; the majority are benign. Parotidectomy is a surgical operation that occurs when a portion or the entire of parotid gland is surgically removed. **Objective:** This paper was designed as a retrospective study aimed to assessing and analyzing the results of Iraqi patients who underwent parotidectomy in the ENT department. **Patients and methods:** 70 patients who participated in endoscopic Parotidectomy surgery were recruited, and their ages ranged between 40 and 60 years. Clinical and surgical data were collected during and after Endoscopic parotidectomy surgery from different hospitals in Iraq for a period ranging from January 6, 2022, to September 25, 2023, which included both the surgery time, estimated blood loss rate, blood pressure and heart rate tests, length of stay in the hospital, admission to the care unit, mortality rate, as well as determining the rate of complications, degree of pain, rate of spread of symptoms, and quality of life after surgery. **Results:** Our findings enrolled clinical outcomes of endoscopic Parotidectomy, which include surgery time was  $228.13 \pm 4.5$  min, rate of bleeding rate was 9 cases, recovery time was  $3.8 \pm 0.23$  weeks, heart rate was  $102.56 \pm 30.89$  BPM, systolic blood pressure was  $133.78 \pm 43.20$  mm Hg, diastolic blood pressure was  $79.58 \pm 11.72$  mm Hg, length of stay in hospital was  $3.35 \pm 0.11$  days, admission to the intensive care unit was included 5 cases, death rate included only one case, postoperative complications included 4 cases, where the most factors were infection got 2 cases, salivary fistula got 1 case, and scars got 1 case. **Conclusion:** The current study indicates that Endoscopic parotidectomy surgery is the safest and most effective treatment that provides a high recovery rate and a low mortality rate for patients with the parotid gland.

**Keywords:** Parotid gland; Endoscopic Parotidectomy; Complications; Quality of life; and Histology.

### INTRODUCTION

Salivary gland tumors are rare; they constitute 3% of all head and neck tumors. The parotid gland is the most frequently affected (90.7% of major salivary gland tumors). Most of them are benign (about 90%), and the main histological type is pleomorphic adenoma. [Spiro, R. H, 1986 – Fiacchini, G. *et al.*, 2018]

The initial surgical treatment of the parotid lesions was frustrating for the surgeon and the patient [Wu, P. A. *et al.*, 2017]. In 1765, Lorenzo Heister reported a parotidectomy without consideration of the vascular network or the facial nerve, with adverse functional results [Pawar, P. *et al.*, 2020]. In 1825, Heyfelder performed a parotidectomy without injury to the facial nerve, and in 1830, Velpeau systematized the search and conservation of the facial nerve [Iseri, M. *et al.*, 2015; Woo, S. H. *et al.*, 2015]. During the early years of the twentieth century and until the 1940s, the suggested treatment was radiotherapy, as recurrences occurred in 35 to 50% [Park, J-O. *et al.*, 2015 – Woo, S. H, 2017]. However, the works of Barley (1941) and Hayes Martin (1952) provided operative techniques that made surgery the safest way to eliminate the tumor while

preserving the function of the facial nerve. [Moher, D. *et al.*, 2009]

Currently, surgical resection is the treatment of choice for parotid gland tumors. The technique varies from partial parotidectomy with lumpectomy to total parotidectomy. The superficial lobe contains 80% of the glandular parenchyma, so superficial parotidectomy is the most widely used for the treatment of parotid tumors. [Higgins, J. P. T. *et al.*, 2011; Slim, K. *et al.*, 2003]

Nowadays, the preservation of the facial nerve is essential for any head and neck surgeon using the parotidectomy technique, especially in the case of benign tumors [McGrath, S. *et al.*, 2020]. The parotidectomy technique advances in the search for better aesthetic results with modifications of the incision, such as the modified rhytidectomy-type incision or the periauricular one, and adding new technology, such as facial monitoring, for the correct localization of the facial nerve. [Park, Y. M. *et al.*, 2020]

Ultrasound and CT scans were defined as important tools for identifying parotid gland

tumors, which ultrasound imaging can assist determine the existence, size, as well as position of a parotid gland tumor, where this was got as a non-invasive and reasonably priced imaging method that employs sound waves to produce pictures of the body's interior components. Ultrasound can distinguish among solid and cystic tumors within the parotid gland. [Zhang, D. *et al.*, 2015]

CT scans, on the other hand, offer very detailed cross-sectional pictures of the parotid gland as well as its surroundings, which CT scans can be assisted to determine the tumor's size, the involvement of adjacent lymph nodes, and the possibility of metastasis to adjacent tissues, where CT scanning is particularly useful when the tumor is big, or there is a suspicion of malignancy. [Woo, S. H. *et al.*, 2016; Huang, X. *et al.*, 2009]

## PATIENTS AND METHODS

A cross-sectional study was conducted for injured patients who underwent Endoscopic parotidectomy surgery and whose clinical and demographic data were collected from different hospitals in Iraq for a period ranging from January 6, 2022, to September 25, 2023, where the patients' ages ranged between 40 - 60 years. This demographic data included both age and gender. Body mass index, ASA (%), symptoms, comorbidities, smoking status, diagnostic methods (ultrasound and CT scan), education status, employment status, and economic level. Furthermore, we determined the level of parotid gland severity for all patients according to the Curie scores, which ranged between (0 - 4), where one represents normal, 2 represents mild, 3

represents moderate, and 4 represents severe. In addition, this study recorded the diagnostic results of patients in terms of tumor location (superficial lobe and deep lobe), histological type (malignant tumor and benign tumor), and histological type of salivary diseases.

Regarding data related to patients during and after Endoscopic parotidectomy, this study recorded surgical data, including surgical time, estimated bleeding rate, number of cases of bleeding, drainage, recovery time, blood pressure tests for both diastolic and systolic blood pressure, and heart rate, the length of stay in the hospital, the rate of patients admitted to the intensive care unit, the mortality rate, the cosmetic level, and the rate of complications. Also, an evaluation was conducted to determine the level of pain in patients after endoscopic parotidectomy during the follow-up period. Our study also evaluated the quality of life for patients after endoscopic parotidectomy during the follow-up period, which evaluation criteria included the physical aspect, the psychological aspect, the social and emotional aspects, and the daily activity aspect with an evaluation standard. The questionnaire was administered to all patients after surgery and ranges from 0 to 100, where 0 represents the worst quality of life while 100 represents the best quality of life. All outcomes' data associated with patients who underwent Endoscopic parotidectomy were systematically constructed and evaluated using SPSS software version 22.0.

## RESULTS

**Table 1:** Demographic characteristics of patients who underwent parotidectomy

Characteristics	Number of patients [70]	Percentage [%]
<b>Age</b>		
40 – 45	10	14.29%
46 – 50	14	20.0%
51 – 55	21	30.0%
56 – 60	25	35.71%
<b>Sex</b>		
Male	42	60.0%
Female	28	40.0%
<b>BMI, [Kg/m2]</b>		
Underweight	14	20.0%
Normal weight	10	14.29%
Overweight	20	28.57%
Obese	26	37.14%
<b>ASA (%)</b>		
I	18	25.71%
II	30	42.86%
III	22	31.43%

<b>Symptoms</b>		
Swelling	11	15.71%
Pain or tenderness in the affected area	9	12.86%
Difficulty opening the mouth	17	24.29%
Dry mouth	14	20.0%
Trouble swallowing	19	27.14%
<b>Comorbidities</b>		
Yes	49	70.0%
No	21	30.0%
Hypertension	38	54.29%
Diabetes	21	30.00%
Kidney diseases	10	14.29%
Asthma	5	7.14%
Heart disease	24	34.29%
<b>Smoking status</b>		
Yes	39	55.71%
No	31	44.29%
<b>Methods used for parotidectomy</b>		
Endoscopic Parotidectomy	70	100%
<b>Diagnoses methods</b>		
Ultrasound	26	37.14%
CT scan	44	62.86%
<b>Education status</b>		
Elementary school	7	10.0%
Secondary school	14	20.0%
College/university	49	70.0%
<b>Occupation status</b>		
Employed	44	62.86%
Unemployed	26	37.14%
<b>Economic status, \$</b>		
< 800	35	50.0%
801 – 1000	23	32.86%
> 1000	12	17.14%

**Table 2:** Distribution level of parotid gland severity on all patients by Corey scores.

Levels	Number of patients [70]	Percentage [%]
Normal [score 1]	0	0.00%
Mild [ score2]	14	20.00%
Moderate [score 3]	34	48.57%
Severe [score 4]	22	31.43%

**Table 3:** Diagnostic results of patients in terms of tumor location, histological type, and histological type of salivary diseases.

Variables	Number of patients [70]	Percentage [%]
<b>Tumor location</b>		
Superficial lobe	56	80.0%
Deep lobe	14	20.0%
<b>Histologic type</b>		
Malignant tumor	7	10.0%
Mucoepidermoid carcinoma	0	
Secretory carcinoma	3	4.29%
Salivary duct carcinoma	0	0.00%
Melanoma carcinoma	0	0.00%
Acinic cell carcinoma	0	0.00%

Squamous cell acinic carcinoma	1	1.43%
Myoepithelial carcinoma	1	1.43%
Lymphoma	2	2.86%
Neuroendocrine carcinoma	0	0.00%
Sebaceous carcinoma	0	0.00%
Benign tumor	63	90.0%
Pleomorphic adenoma	40	57.14%
Warthin's tumor	9	12.86%
Basal cell adenoma	3	4.29%
Oncocytoma	4	5.71%
Schwannoma	2	2.86%
Myoepithelioma	5	7.14%

**Table 4:** Perioperative data of endoscopic parotidectomy.

Perioperative data	Number of patients [70]	Percentage [%]
Surgery time, min [Mean $\pm$ SD]	228.13 $\pm$ 4.5	
Bleeding rate, N [%]		
Yes	9	12.86%
No	61	87.14%
Drainage, mL, [Mean $\pm$ SD]	135.64 $\pm$ 2.86	
Recovery time, weeks, [Mean $\pm$ SD]	3.8 $\pm$ 0.23	
Heart rate (mean $\pm$ SD), BPM	102.56 $\pm$ 30.89	
Systolic blood pressure (Mean $\pm$ SD)	133.78 $\pm$ 43.20	
Diastolic blood pressure (Mean $\pm$ SD)	79.58 $\pm$ 11.72	
Length of stay in hospital, days, [Mean $\pm$ SD]	3.35 $\pm$ 0.11	
Admission to the intensive care unit, N [%]	5	7.14%
Mortality rate, N [%]		
Yes	1	1.43%
No	69	98.57%

**Table 5:** Postoperative complications outcomes.

Complications	Number of patients [70]	Percentage [%]
Infection	2	2.86%
Temporary facial weakness	0	0.0%
Bleeding	0	0.0%
Salivary fistula	1	1.43%
Swelling and pain	0	0.0%
Scars	1	1.43%
Total	4	5.71%

**Table 6:** Assessment of the level of pain at patients after endoscopic parotidectomy during the follow-up period.

Follow-up time [weeks]	Pain scores
1 <sup>st</sup> week	1.28 $\pm$ 0.13
2 <sup>nd</sup> week	2.01 $\pm$ 0.001
3 <sup>rd</sup> week	0.67 $\pm$ 0.0023

**Table 7:** Assessment of quality of life for patients after endoscopic parotidectomy during follow-up period.

Items	QOL scores
Physical aspect	86.48 $\pm$ 8.23
Psychological aspect	83.11 $\pm$ 6.23
Social and emotional aspects	78.14 $\pm$ 5.72
Daily activity aspect	88.52 $\pm$ 3.64

## DISCUSSION

Our results found that the rate of males were higher with 60% to compare with females with 40%; BMI classification divided into patients with underweight BMI was 14 cases, patients with normal weight BMI was 10 cases, patients with overweight BMI was 20 cases, and patients who had obesity was 26 cases, we noticed most symptoms prevalence within patients were difficulty opening the mouth got 17 cases, dry mouth got 14 cases, and trouble swallowing got 19 cases, rate of patients with comorbidities was 70%, where hypertension with 38 cases, heart disease with 24 cases, diabetes with 21 cases which all these parameters enrolled as the greatest factors effected on patients, smokers were 55.71%, as well as diagnoses methods conducted on patients included ultrasound with 26 cases and CT scan with 44 cases.

In addition, we determined the level of parotid gland severity on all patients by Corey scores which include normal with 0 cases, mild with 14 cases, moderate with 34 cases, severe with 22 cases. Based on ultrasounds and CT scan diagnoses techniques, we defined diagnostic results of patients in terms of tumor location who, include the superficial lobe with 80% of patients and the deep lobe with 20% of patients. Histological types were divided into two which are malignant tumors with 10% where the most types of salivary diseases who spread into patients were secretory carcinoma with 3 cases, lymphoma with 2 cases, squamous cell acinic carcinoma include one case only, myoepithelial carcinoma had one case only too and benign tumor with 90% which include Pleomorphic adenoma with 40 cases where this factor was defined as the most common type of type of salivary diseases.

According to perioperative of endoscopic parotidectomy, our findings were enrolled surgery time was  $228.13 \pm 4.5$  min, rate of bleeding rate was 9 cases; recovery time was  $3.8 \pm 0.23$  weeks, heart rate was  $102.56 \pm 30.89$  BPM, systolic blood pressure was  $133.78 \pm 43.20$  mm Hg, diastolic blood pressure was  $79.58 \pm 11.72$  mm Hg, length of stay in hospital was  $3.35 \pm 0.11$  days, admission to the intensive care unit was included 5 cases, death rate included only one case, postoperative complications included 4 cases, where the most factors were infection got 2 cases, salivary fistula got 1 case, and scars got 1 case.

Endoscopic parotidectomy is associated with reduced postoperative pain and complications due

to the surgical instruments used in endoscopic procedures are smaller and less invasive, making them less traumatic to the surrounding tissues. [Chen, M-K. *et al.*, 2007]

Previous studies have demonstrated that Endoscopic parotidectomy has various advantages over standard open surgery, including decreased scarring, less postoperative discomfort, shorter hospital stays, as well as faster recovery times; where Endoscopic parotidectomy has been shown to have equivalent oncologic results, thereby providing a safe and effective therapeutic option for people with parotid gland illness. [Lin, S. D. *et al.*, 2000; Li, T. *et al.*, 2019]

An American study discovered that Endoscopic parotidectomy can reduce the risk of complications, including infection, excessive bleeding, and nerve damage. The minimally invasive nature of endoscopic parotidectomy usually results in shorter hospital stays and faster recovery times in patients, allowing them to return to their normal activities sooner, where the use of endoscopic tools as well as cameras allows surgeons to have better visualization. [Kim, J. P. *et al.*, 2020]

## CONCLUSION

Our study demonstrated that Endoscopic parotidectomy surgery plays a crucial role in achieving high clinical results by causing better visualization of the surgical site, which leads to more precise and accurate removal of diseased tissue, which improves the quality of life of patients because of its advantages in terms of lower rates of pain and complications, faster recovery, a higher recovery rate, shorter surgery time and a lower bleeding rate.

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