



# Mini-Incision Parotidectomy-Our Technique

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**Abstract** Traditional parotidectomy incision was devised by Blair (1912) which was modified by Bailey (1941). Over the years various approaches and techniques have evolved to improve the aesthetic outcome and at the same time for complete disease clearance with reduced complications. In this study, we evaluated the feasibility of our mini-incision parotidectomy technique along with the surgical and quality of life (QOL) outcomes. This prospective case series was conducted at Apollo Hospitals, Bangalore over a period of 2 years (June 2018-August 2020) and includes 20 patients. The surgical outcomes were assessed in terms of feasibility of mini-incision technique with respect to levels of parotid involved and functional outcomes in terms of presence or absence of complications like facial palsy (temporary or permanent), seroma and Frey's syndrome. Patient related quality of life (QOL) outcomes were assessed in terms of post-operative pain score, patient comfort score and cosmetic score by using numerical rating scale-11 (NRS-11). The mini-incision parotidectomy technique is feasible for lesions in all the parotid levels and conversion or lengthening of incision was not needed in any of the cases. 2(10%) patients had temporary facial palsy (House-Brackman grade III) which was recovered within 3 weeks after surgery. One patient (5%) with adenoid cystic carcinoma had permanent facial palsy. Out of 20 patients 2(10%) had seroma and 1(5%) patient presented with Frey's syndrome. Mean post-operative pain score at 0, 6 and 24 h were 4.8, 3.4 and 1.8 out of 10 respectively. Mean comfort score was 9 out of 10 and

mean cosmetic score was 9.5 out of 10. Mini-incision parotidectomy technique can render improved functional as well as aesthetic outcomes after parotidectomy without compromising the surgical clearance of the disease process.

**Keywords** Mini-incision parotidectomy · Parotid level · Aesthetic outcomes · Quality of life outcomes · Cosmetic score

## Introduction

Parotidectomy is one of the commonest head and neck surgical procedure performed for both benign and malignant parotid gland lesions. Traditional parotidectomy incision was devised by Blair (1912) which was modified by Bailey (1941). Over the years various approaches and techniques have evolved to improve the aesthetic outcome and at the same time for complete disease clearance with reduced complications. European salivary gland society (ESGS) had proposed various levels in parotid to define, report and compare the resections performed [1]. In this study, we evaluated the feasibility of our mini-incision parotidectomy technique along with the surgical and quality of life (QOL) outcomes.

## Material and Methods

This prospective case series was conducted at Apollo Hospitals, Bangalore over a period of 2 years (June 2018–August 2020) after obtaining the Institutional Ethical Committee approval. Our study includes 20 consecutive patients who presented to our outpatient department with benign parotid tumors. Patients underwent contrast

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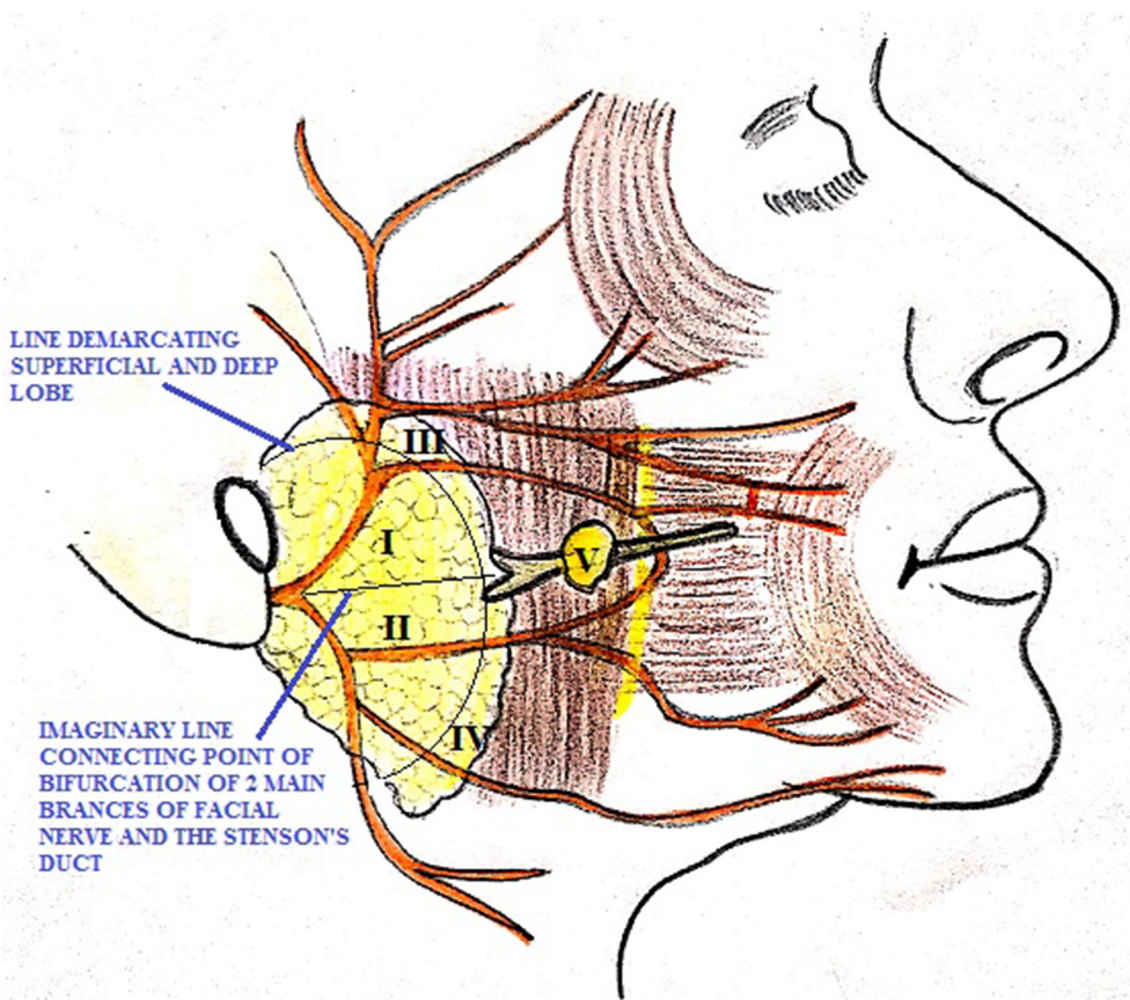
enhanced CT scan or MRI of neck along with ultrasound guided fine needle aspiration cytology before the surgery. Informed consent was obtained from all the study participants and they were counselled regarding conversion or lengthening of the incision if the access was inadequate. The level of parotid involvement by the lesion and type of parotidectomy performed was classified as per ESGS 2016 classification (Fig. 1) [1]. The mean operation time was calculated from the time of skin infiltration to the completion of skin sutures.

The surgical outcomes were assessed in terms of feasibility of mini-incision technique with respect to levels of parotid involved and functional outcomes in terms of presence or absence of complications like facial palsy (temporary or permanent), seroma and Frey's syndrome. Patient related quality of life (QOL) outcomes were assessed in terms of post-operative pain score, patient comfort score and cosmetic score by using numerical rating scale-11 (NRS-11). All patients were treated with same analgesics and post-operative pain was assessed at 0, 6 and

24 h after surgery. Patient comfort score was assessed at the time of discharge. All patients were followed up at 1st week, 1st month and 3rd month after surgery. Cosmetic score was evaluated at 3<sup>rd</sup> month follow-up. Mean hospital stay, day of drain removal and day of return to daily routine was also evaluated.

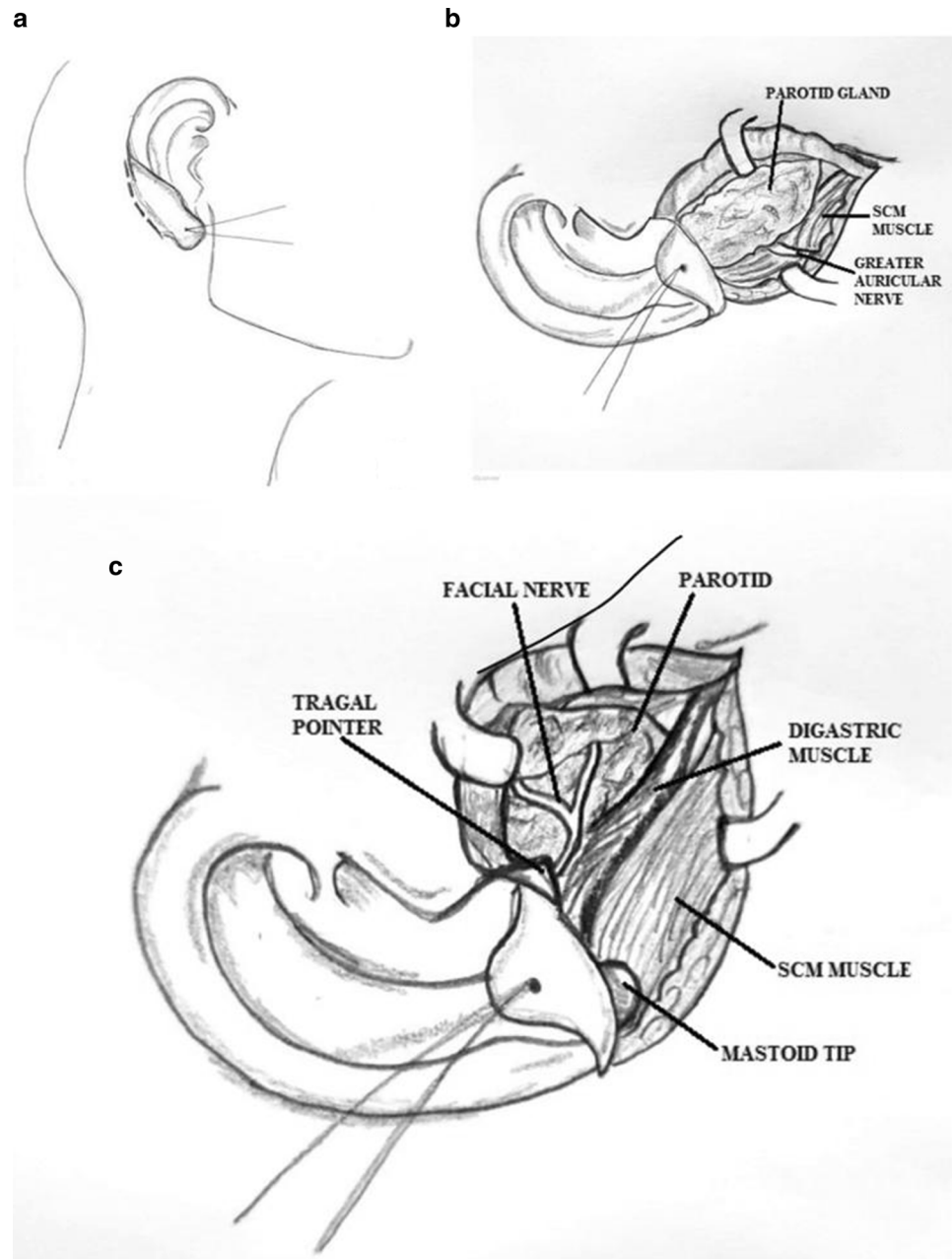
## Surgical Technique

A 3–4 cm vertical skin incision was given in the retro-auricular groove inferiorly reaching till the level of attachment of ear lobule to the face (Fig. 2a). Flaps are elevated deep to the plane of superficial musculo-aponeurotic system (SMAS) and subcutaneous tissue undermined to facilitate retraction of flaps for better access (Fig. 2b). Tragal pointer identified and tail of parotid gland was identified and elevated. Sternocleidomastoid muscle identified and retracted and posterior branch of greater auricular nerve was identified and preserved in all cases. Next step



**Fig. 1** Parotid levels as per ESGS classification

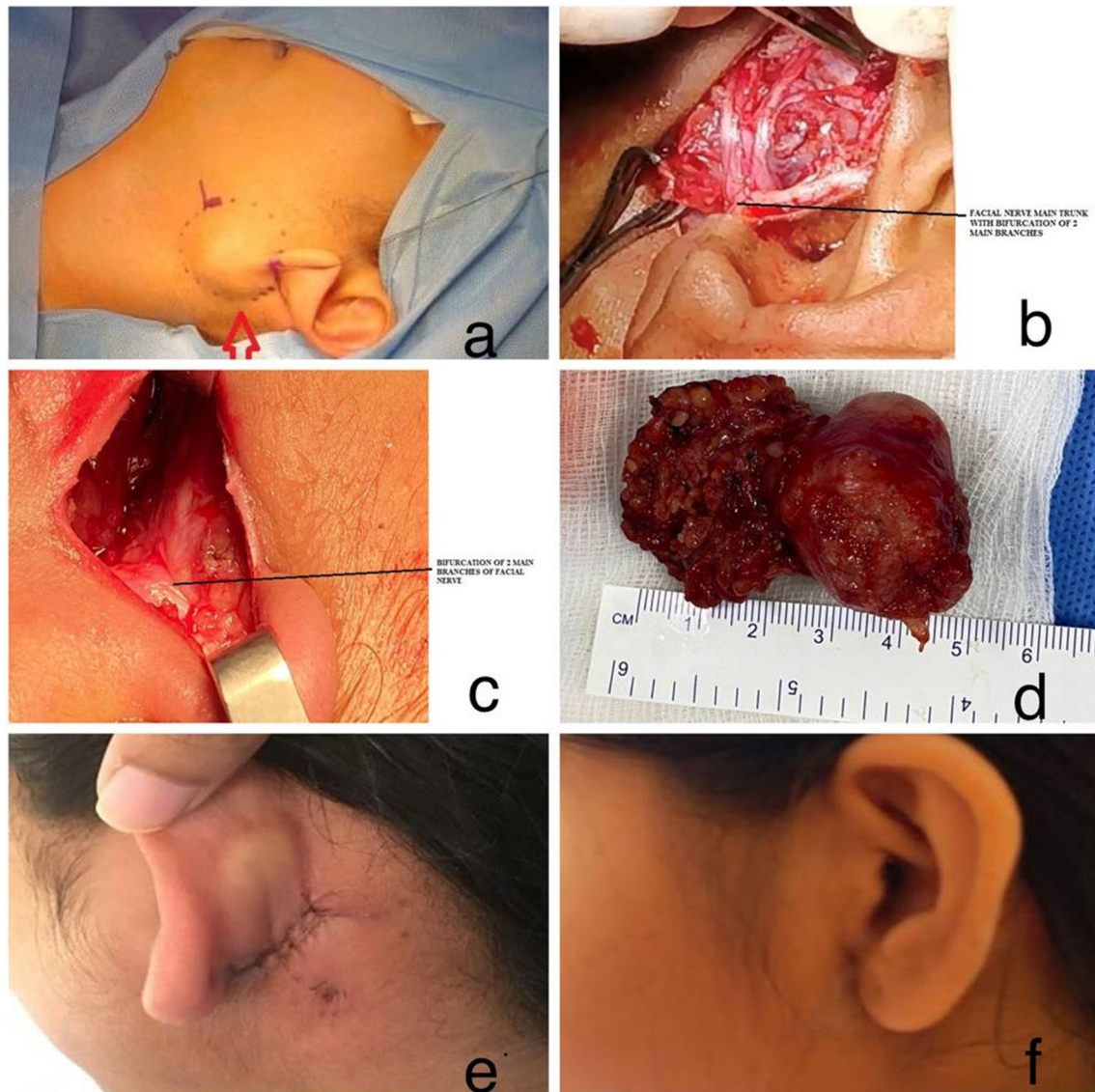
**Fig. 2** **a** Diagrammatic representation of 3–4 cm vertical incision in the post-aural groove. **b** Diagrammatic representation showing skin undermining and visualization of parotid tissue and sternocleidomastoid muscle. **c** Diagrammatic representation of identification of facial nerve trunk by the markers like tragal pointer, posterior belly of digastric muscle



was the identification of posterior belly of digastric muscle. Then the tympano-mastoid suture line was palpated and the main trunk of facial nerve identified (Fig. 2c). Dissection proceeded at the plane of facial nerve trunk and main branches as per standard technique. The tumor was removed in toto along with the cuff of normal parotid tissue. In cases of large tumors the tissue was maneuvered in order to remove through the small incision. After achieving complete hemostasis minivac drain was inserted and secured and wound closed in single layer simple sutures using 3–0 monocryl. The per-operative techniques and post-operative image of the index case is shown in Fig. 3a–f.

## Results

Out of 20 patients included in our study, 8(40%) were males and 12(60%) were females with male to female ratio of 2:3 and the mean age of presentation was 33.5 years (14–68 years). Left side was involved in 13(65%) cases and right side in 7(35%) cases with left to right ratio of 1.8:1. Most common presentation was long standing painless swelling. 2 patients had already been operated for pleomorphic adenoma in the past and presented with recurrent swelling within the period of 3 months from the previous procedure. None of the patients presented with facial palsy or skin involvement at the time of presentation.



**Fig. 3** **a** Pre-operative image showing swelling in the left parotid region. **b** Intra-operative image showing main trunk of facial nerve with two main branches. **c** Complete resection of tumor. **d** Specimen

of tumor along with the normal parotid tissue. **e** Post-aural wound appearance on post-operative day-1. **f** Post-operative image of patient at 1st month follow-up without any visible scar

Mean size of the tumor was  $3.9 (\pm 0.37) \times 3.8 (\pm 0.28)$  cm. Modification or lengthening of incision was not needed in any case as the access to the tumor and facial nerve was adequate. The levels of parotid levels involved and type of parotidectomy performed is presented in Table 1. Extra capsular dissection (ECD) was performed in one case where only level II was involved and the size of the tumor was less than 2 cm. None of the patient had any intra-operative complications.

Pre-operative cytology showed benign tumor pathology in all our patients. However the intra-operative frozen section analysis revealed 4 (20%) cases to be malignant. Since the tumor size in these patients were less than 2 cm (T1) total conservative parotidectomy (Parotidectomy I-IV)

was done in these cases along with level II cervical lymph node sampling. As none of the patients with malignant lesion showed lymph nodes metastasis on frozen section, further selective neck dissection was not performed. The resected margins were free of tumor in all these cases. The mean operation time was 118 min (88–148 min). Post-operative histopathological examination was reported as pleomorphic adenoma in 14(70%) patients, Warthin's tumor in 2(10%) patients, mucoepidermoid carcinoma in 3(15%) patients with high grade in two patients and low grade in 1 patient and adenoid cystic carcinoma- high grade in 1(5%) patient. 2 patients with high grade mucoepidermoid carcinoma and 1 patient with high grade adenoid cystic carcinoma underwent post-operative adjuvant

**Table 1** Parotid levels involved with respective type of resection performed as per ESGS classification

Parotid levels involved	Pathology (No. of patients)	Type of resection	Total no. of patients (%)
I and II	Pleomorphic adenoma (8)	Parotidectomy	8(40)
III and IV	Pleomorphic adenoma (3)	Parotidectomy I–IV	3(15)
II and III	Pleomorphic adenoma (1)	Parotidectomy I–IV	1(5)
I and IV	Warthin's tumor (2)	Parotidectomy I–IV	2(10)
I	Pleomorphic adenoma (1)	Extracapsular Dissection	2(10)
	Adenoid cystic carcinoma (1)	Parotidectomy I–IV	
II	Mucoepidermoid carcinoma (2)	Parotidectomy I–IV	2(10)
V	Pleomorphic adenoma (1)	Parotidectomy I, II,V	2(10)
	Mucoepidermoid carcinoma (1)	Parotidectomy I–IV	

radiation therapy. 2(10%) patients had temporary facial palsy (House-Brackman grade III) which was recovered within 3 weeks after surgery. One patient (5%) with adenoid cystic carcinoma had permanent facial palsy. Out of 20 patients 2(10%) had seroma and 1(5%) patient presented with Frey's syndrome.

Mean post-operative pain score at 0, 6 and 24 h were 4.8 (4.5–5.1), 3.4 (3.1–3.7) and 1.8 (1.6–2.0) out of 10 respectively. Mean comfort score was 9 (8.6–9.4) out of 10 and mean cosmetic score was 9.5 (9.2–9.8) out of 10. Mean duration of hospital stay was 1.8 days (1.5–2.1) and mean day of drain removal was 1.9 days (1.5–2.3). The mean duration of return to daily activities was 4.9(4.6–5.2) days. Mean follow-up period was 16.5 months (5–27 months) and none of the patients had any recurrent disease till date.

## Discussion

Parotid gland neoplasms are one of the most common head and neck masses with 70% of parotid lesion being benign. Parotidectomy is the surgical technique performed for both benign and malignant parotid lesions. European Salivary Gland Society (ESGS) has proposed a classification system for determining the levels of parotid gland that is involved by the pathology and also has defined the type of parotidectomy performed accordingly [1]. The disease clearance has an important goal in the surgical outcome. However, functional and aesthetic outcomes have high impact on patient's quality of life [2–5].

Over the century, the approaches and incisions have evolved in the field of parotid surgery to improve both the functional as well as aesthetic outcomes. Post-operative scar over the face and neck leads to negative impact on the individual's quality of life. Modified Blair's incision by Bailey (1941) is the most common incision used for parotidectomy. Facelift incision, modified facelift incision,

intra-auricular modification of facelift incision, retro-auricular hairline incision and small access post aural incision have been experimented to improve the cosmetic outcome after parotid surgeries by various authors [2–12]. The incisions and approaches greatly depend on three factors viz size of the tumor, location of the tumor and the difficulty in resection like deep lobe tumors [12].

In our study we describe a mini-incision parotidectomy technique and have named it as SN's incision which is a 3–4 cm vertical incision in the post-aural groove. We assessed the feasibility of this incision with respect to various parotid level lesions and the type of resection performed. The post-aural incision usually has limited access to the lesions in anterior and superior levels, tumors greater than 6 cm in size and deep lobe lesions [12]. In our study, we were able to resect the lesions in all five mentioned parotid levels. The conversion or lengthening of incision was not needed in any of our cases as the subcutaneous undermining of the flaps allow for maximal retraction and adequate exposure of the surgical field. However, maneuvering of the tissue through the incision was performed for the tumors greater than 5 cm for removal.

The rate of occurrence of temporary and permanent facial palsy after superficial parotidectomy is 23% and 2% and after total parotidectomy is 54% and 17% respectively [13]. The rate of seroma and Frey's syndrome in literature is 17% and 43% respectively [13]. In our study, 2(10%) had temporary facial palsy, 1(5%) patient had permanent facial palsy, 2(10%) patients had seroma and 1(5%) patient had Frey's syndrome which is comparable to the literature. The mean cosmetic score for modified Blair's incision, Facelift incision and retro-auricular hairline incision was 5.8, 6.8 and 8.1 respectively [6]. The mean cosmetic score in our series was 9.5 out of 10.

We advocate that mini-incision parotidectomy technique can be safely performed in all benign parotid tumors less

than 6 cm. We performed 4 cases of parotid malignancy since it was less than 2 cm (T1) and without any nodal metastasis. However, this technique may not be feasible in large malignant lesions with nodal metastasis requiring elective nodal dissection, skin involvement, recurrent tumors, irradiated patients and benign tumors greater than 6 cm. Mini-incision technique requires a learning curve and excellent surgical expertise. Limitations of our study include smaller study population and shorter mean follow-up period.

## Conclusion

The mini-incision parotidectomy is feasible for benign parotid tumors involving all the parotid levels. This technique can render improved functional as well as aesthetic outcomes after parotidectomy without compromising the surgical clearance of the disease process.

**Author contribution** Satish Nair: Substantial contributions to the conception or design of the work, revising it critically for important intellectual content, final approval of the version to be published. J G Aishwarya: Substantial contributions to the acquisition of data for the work, revising it critically for important intellectual content. Aditya Jain, Pavithra V, Sneha Mohan: Substantial contributions to the acquisition of data for the work and revising it.

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## Declarations

**Conflict of interest** The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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