

Extended cervicomastoid approach with sternocleidomastoid flap reconstruction for parotid surgery: A better esthetic technique

ABSTRACT

Aim of the Study: The aim of the study is to compare the esthetic outcome of extended cervicomastoid approach with reconstruction with conventional approach (modified Blair's incision) for parotid surgery.

Materials and Methods: 48 patients were enrolled and grouped into A: surgery through extended cervicomastoid incision with sternocleidomastoid reconstruction and B: surgery through modified Blair's incision. After parotid surgery, patients were followed up to 6 months on the basis of flap ischemia, patient satisfaction, and cosmesis (visual analog scale [VAS]).

Results: In our study, preauricular depression over the face was present in 4.2% and 95.8% patients Group A and B at 6 months, respectively ($P < 0.001$) and retromandibular depression (70.8%) in Group B ($P < 0.001$). Subjective Frey's syndrome was present in 8.3% of patients of Group B ($P > 0.05$). The mean value of VAS between the two groups was 1.08 ± 0.28 and 3.29 ± 0.62 at 6 months ($P = 0.001$) while mean change was significantly ($P = 0.03$) higher in Group A (1.00 ± 0.00) as compared to Group B (0.20 ± 0.72) from postoperative to 6 months, respectively. Patient of Group A had good satisfaction level (62.5% and 91.7%) at 6 weeks and 6 months while Group B patients had fair satisfaction level (87.5%) at 6 weeks and poor satisfaction level 79.2% at 6 months.

Conclusion: Parotidectomy through extended cervicomastoid incision with sternocleidomastoid flap reconstruction experienced lower rates of postoperative complications, flap necrosis, and gustatory sweating in comparison to cervicomastoid facial approach, and thus, the previous incision is esthetically superior that allows cheek contour reconstruction with no increase in operative time or postoperative complications.

Keywords: Extended cervicomastoid incision, modified Blair's incision, parotid tumors, salivary gland

INTRODUCTION

Parotid gland tumors account for 80% of salivary neoplasm and 3% of all tumors of head and neck.^[1] These neoplasms are mainly benign and account for 2% to 6% of all head-and-neck pathologies.^[2,3] Benign histological types are pleomorphic adenoma, Warthin tumor, myoepithelioma, basal cell adenoma, and oncocytoma while in malignant tumors, most frequent are mucoepidermoid carcinoma, adenoid cystic carcinoma, carcinoma ex pleomorphic adenoma, acinic cell carcinoma, myoepithelial carcinoma, adenocarcinoma, basal cell carcinoma.^[4-6]

Modified Blair's incision offers excellent surgical access to parotid gland but it inevitably leaves visible scar, retraction

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of facial scar, and increased risk of flap ischemia.^[7] To overcome these esthetic issues, retroauricular hairline incision, rhytidectomy incision, facelift incision, and minimal incision are being used. Small incision in parotid surgery is not suitable for malignant tumor with or without skin involvement, facial nerve or skull base involvement or parapharyngeal extension as restricted exposure further lead to facial nerve injury, incomplete resection, poor adaptability for neck dissection, and increased risk of flap ischemia.^[8,9]

Total or superficial parotidectomy especially when reconstructive technique is not used, leads to preauricular and retromandibular contour deformity with scar. There are various options to overcome this contour deformity such as sternocleidomastoid muscle (SCM) flap, superficial musculoaponeurotic system flap, and temporoparietal fascial flap.^[10] Reconstruction helps to maintain facial symmetry, dissimulating the postparotidectomy retromandibular depression, and Frey's syndrome. Sternocleidomastoid flap has extra advantage over other flap as it receives multiple blood supply from the occipital artery, superior thyroid artery, and transverse cervical artery, therefore, it can be used either as a superiorly or inferiorly based flap.

To combat the above complications, we used an extended cervicomastoid approach which has advantage such as no preauricular scar, reduced risk of flap necrosis and less retraction of scar. In addition, we used SCM flap to avoid Frey's syndrome and to preserve facial contour. It provides better cosmetic results without compromising surgical exposure and increasing surgical time.^[11]

Sternocleidomastoid muscle flap

Advantages

- Lower risk of skin injury during flap design
- An ability to provide a larger width and length of muscle tissue that can be interposed
- Ease with flap design and axis of rotation after parotidectomy
- Well vascularized
- No additional skin incision required
- No significant decrease in function of SCM.

Limitations

- Bulky size of flap may mask recurrences in the parotid bed.

MATERIALS AND METHODS

Ethical Clearance was obtained from Institutional Ethical Committee with Ref no.777/Ethics/R.cell/18 dated 02-07-18. 48 patients were studied in the Department of Otorhinolaryngology and Head and Neck surgery during period

of August 2017 to July 2018 and divided into two groups, namely Group A: patients undergoing parotid surgery using extended cervicomastoid incision with obliteration of defect by SCM flap and Group B: patients undergoing parotid surgery using modified Blair's incision without SCM flap.

Inclusion criteria

- Patients included were in age group 10–60 years
- Cases with benign parotid tumor requiring surgical management

Exclusion criteria

- Patients of age < 10 years and more than 60 years
- Patients with any systemic illness or comorbidities
- Patients with parotid malignancy/recurrent case and arteriovenous malformations.

All the patients who satisfied the inclusion criteria were enrolled in the study. After complete hematological, radiological, and cytological investigations, patients underwent superficial or total parotidectomy depending on extension of benign parotid lesion.

Surgical technique

For an extended cervicomastoid approach, the patient's neck was extended and the head rotated to the opposite side. An incision was started from the postauricular area and it was continued in the cervical area in upper neck skin crease [Figure 1]. Incision was continued through subcutaneous fat on to the SCM and thick skin flap was elevated. The facial nerve was identified and dissected carefully. Parotidectomy (superficial/total) was done depending on the pathology. After removal of tumor, SCM flap was used to obliterate the defect to avoid Frey's syndrome and dimpling [Figures 2 and 3]. Skin closure was secured with interrupted sutures using vicryl 4-0 and nylon. In modified Blair's incision, surgery was performed similarly to that of extended cervicomastoid incision group except that the type of incision differed. All patients were followed up to 6 months postoperatively on the basis of flap ischemia, cosmesis (visual analog scale [VAS]), subjective Frey's syndrome, retromandibular, preauricular depression, and patient's satisfaction.

Data collected were subjected to statistical analysis using SPSS software version 26.0. Data were summarized as mean \pm standard deviation. Categorical group were compared by Chi-square test. Two tailed $P < 0.05$ was considered statistically significant.

OBSERVATIONS AND RESULTS

The mean age of Group A and Group B was 35.67 ± 13.07



Figure 1: Extended Cervicomastoid incision

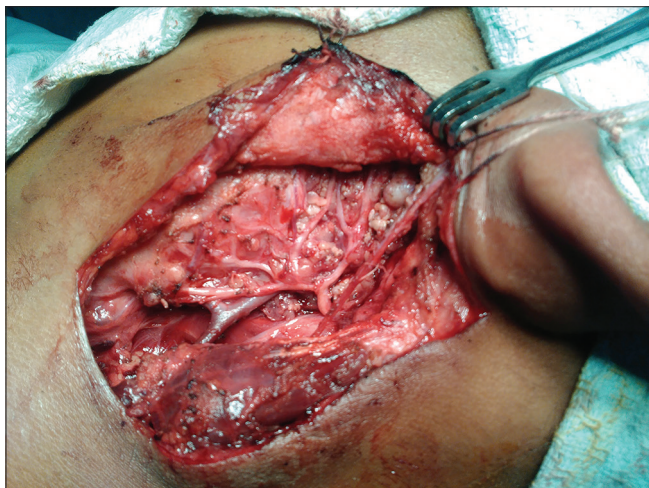


Figure 2: After superficial parotidectomy showing Facial nerve

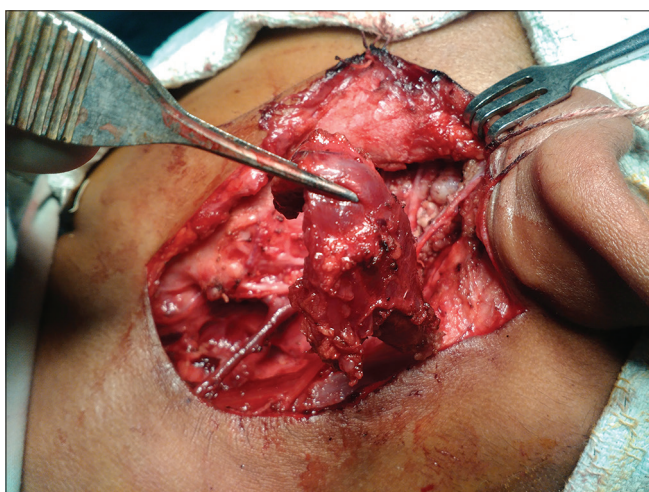


Figure 3: Sternocleidomastoid flap reconstruction after parotidectomy

and 31.25 ± 12.64 years, respectively. 58.3% patients of Group A 50% of Group B were males [Table 1]. There was no significant ($P > 0.05$) difference in age and gender

between the groups. Pleomorphic adenoma was the most common tumor (87.5% in Group A and 83.3% in Group B, $P = 0.38$).

Preauricular and retromandibular depression

Table 2 shows preauricular depression in 4.2% and 95.8% patients of Group A and Group B at 6 months, respectively ($P < 0.001$). Retromandibular depression was present in 70.8% patients in Group B ($P < 0.001$). Flap ischemia was not present in any patients in Group A, however, it was present in 12.5% patients in Group B at 1 week postoperatively.

Frey's syndrome and visual analog scale

Subjective Frey's syndrome was absent in Group A and present in 8.3% patients of Group B ($P > 0.05$) [Table 3]. The mean value of VAS between the two groups as 2.08 ± 0.28 and 3.50 ± 0.51 at postoperatively, 1.75 ± 0.53 and 3.42 ± 0.50 at 6 weeks, and 1.08 ± 0.28 and 3.29 ± 0.62 at 6 months, $P = 0.001$ [Table 4]. The mean change in VAS was significantly ($P = 0.03$) higher among the patients of Group A (0.33 ± 0.48) as compared to Group B (0.08 ± 0.28) from postoperative to 6 weeks and from postoperative to 6 months in Group A (1.00 ± 0.00) compared to Group B (0.20 ± 0.72), respectively [Table 5].

Patient's satisfaction

Patients of Group A had good satisfaction level (62.5% and 91.7%) at 6 weeks and postoperative 6 months, respectively, while Group B patients had fair satisfaction level (87.5%) at 6 weeks and poor satisfaction level (79.2%) at 6 months postoperatively [Table 6].

DISCUSSION

Superficial parotidectomy is a well-known treatment for benign tumors. The first description of a specific incision for parotidectomy was given by Gutierrez in 1903 since then many modifications in the incision has been made to deal with hypertrophied scar, a permanent noticeable depression over cheek and gustatory sweating.^[12]

In conscious patients' stigma of visible facial scar following the parotid surgery may lead to severe psychological distress. Sometimes, these visible scars are interpreted by patients as an unfavorable result of surgery and with the passage of time, patient's anxiety may be directed away from the pathological cause of surgery by fixation on the visible scar. This is the reason why appropriate selection of the incision becomes important which can provide a technically good access to the surgery while ensuring good postoperative cosmesis.

Table 1: Demographic profile of patients

Demographic profile (age/sex)	Group A (n=24)		Group B (n=24)		P ¹
	No.	%	No.	%	
10-20	4	16.7	4	16.7	0.21
20-30	4	16.7	10	41.7	
31-40	7	29.2	3	12.5	
40-60	9	37.5	7	29.2	
Mean±SD	35.67±13.07		31.25±12.64		
Male	14	58.3	12	50.0	0.56
Female	10	41.7	12	50.0	

¹Chi-square test

Table 2: Pre-auricular & Retromandibular depression

Duration (Post-op 6 months)	Group A (n=24)		Group B (n=24)		P ¹
	No.	%	No.	%	
Pre-auricular depression					
Present	1	4.2	23	95.8	0.001*
Absent	23	95.8	1	4.2	
Retro-mand. depression					
Present	0	0	17	70.8	0.001*
Absent	24	100	7	29.2	

¹Chi-square test, *Significant

Table 3: Comparison of subjective Frey’s syndrome between the groups across the time periods

Time periods (Post-op 6 months)	Group A (n=24)		Group B (n=24)		P ¹
	No.	%	No.	%	
Present	0	2	8.3	0.14	0.14
Absent	24	100	22	91.7	

¹Chi-square test

Table 4: Comparison of patient’s satisfaction between the groups across the time periods

Time periods	Group A (n=24)		Group B (n=24)		P ¹
	No.	%	No.	%	
6 weeks					
Good	15	62.5	0	0.0	0.001*
Fair	9	37.5	21	87.5	
Poor	0	0.0	3	12.5	
Post-op 6 months					
Good	22	91.7	0	0.0	0.001*
Fair	2	8.3	5	20.8	
Poor	0	0.0	19	79.2	

¹Chi-square test, *Significant

Tumor characteristics and presenting complaints

The pathology was similar into groups; pleomorphic adenoma was the most common histological diagnosis (21 out of 24 in Group A; 87.5% and 20 out of 24 in Group B; 83.3%). Swelling was the most common presenting complaint (100%) followed by mild pain over the swelling 16.6%. There was no complaint of facial weakness, restricted jaw movement, decreased sensation over involved area, intraoral swelling, recurrent tumor, and cervical lymphadenopathy. In the study conducted by Poland otolaryngologist Pietniczka-Zaleska

concurrent that 100% of his patients had swelling as presenting complaint.^[13]

Postoperative outcome measures

In our study, in Group A, using extended cervicomastoid incision, there was no flap ischemia in 1 week. In contrast, Group B, flap ischemia was present in 12.5% patients. Due to sharp angulation over mastoid part of incision, there is compromised vascular supply in modified Blair’s incision so there are more chances of flap necrosis in Group B patients. Warren E. Hagan and Anderson found that in traditional incision’s sharp angulated vertical segment due to the interruption of subdermal capillary blood flow as it nourishes the elevated skin flap may results in devitalization at the tip of the flap at the junction beneath the lobule of the ear.^[14]

Preauricular and retro-mandibular depression

In patients of extended cervicomastoid incision with SCM flap, preauricular depression was present in 4.2% patients at 6 months while in patients with modified Blair’s incision 95.6% patients had at 6-month postoperative period. Retromandibular depression was present only in Group B in 70.8% of patients at 6 months. This marked difference was due to bulk of SCM flap interposed between the skin and bed of dissected parotid.

Subjective Frey’s syndrome

In our study, 8.3% of patients with modified Blair’s incision without reconstruction had subjective Frey’s syndrome at 6-month follow-up while it was absent in patients with extended cervicomastoid incision with reconstruction at 6 months. Nofal and Mohamad found that the superiorly based SCM flap partial-thickness lowers the incidence of Frey syndrome objectively and subjectively.^[15] Gooden *et al.* studied that the SCM flap may play a significant role in reducing the incidence of Frey’s syndrome and maintaining facial contour after parotidectomy.^[16]

Visual analog scale

The mean VAS score in patients with extended cervicomastoid incision remains toward lower side (more satisfaction) in comparison to patients with modified Blair’s incision (less satisfaction). Using extended cervicomastoid incision, there was no visible scar and no significant preauricular and retromandibular depression. Nofal and Mohamad found that the superiorly based sternocleidomastoid flap partial thickness offers a reasonable cosmetic option for reconstruction following either superficial or total parotidectomy by improving the facial deformity.^[15] Patient satisfaction was more when extended cervical mastoid incision with sternocleidomastoid flap reconstruction was used. There were no significant differences in operative

Table 5: Comparison of VAS between the groups across the time periods

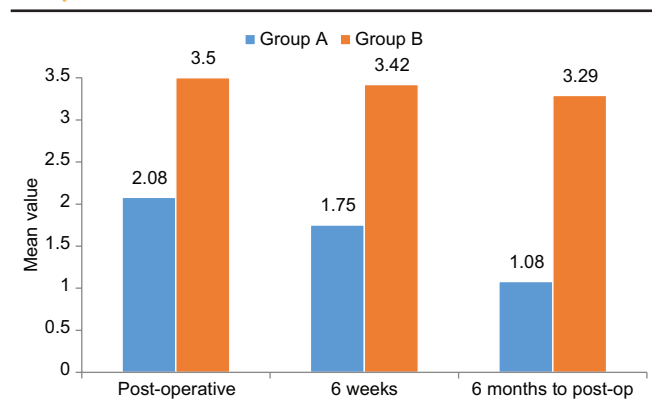
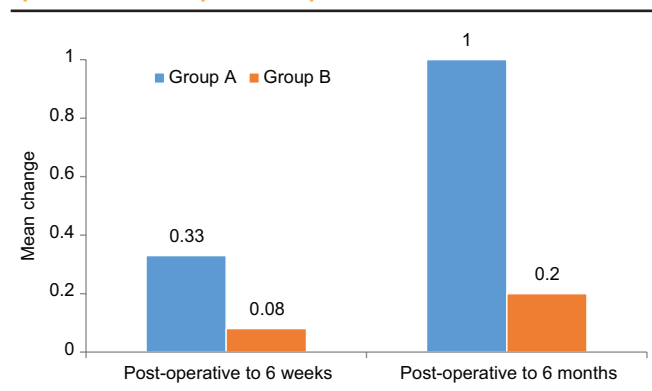


Table 6: Comparison of VAS between the groups from post-operative to subsequent time periods



time and location or size of tumor or completeness of resection.

Therefore, in this study, we found that there were better postoperative outcomes in group where extended cervicomastoid incision with reconstruction was used. The esthetic outcome and complications related to parotidectomy can be minimized using this incision which improves quality of life of the patient and better functional outcome.

CONCLUSION

Tumors of parotid gland are generally removed by the standard modified Blair’s incision without reconstruction of parotid bed. Progress in surgery continues to be made in arriving at less deforming and more cosmetic surgical results. Hidden incision is not only feasible but often preferred and possible too in parotid surgery.

In this study, we observed patients who underwent parotidectomy for benign tumors through extended cervicomastoid incision with SCM flap reconstruction experienced lower rates of postoperative complication such

as flap ischemia and gustatory sweating in comparison to the modified Blair’s approach. An extended cervicomastoid incision for parotidectomy provides generous access to most regions of the parotid gland which is as good as the access provided by modified Blair’s incision.

In conclusion, it is advisable for otorhinolaryngologist and head-and-neck surgeons to adapt extended cervicomastoid incision to the patients who are concerned about the cosmetic results of surgery. However, first and foremost there must be no doubt about the indication for the procedure with the respect of size location and histological characteristics of the tumors.

The extended cervicomastoid incision provides a safe alternative approach to parotid tumors and adequate exposure for even total parotidectomy. It offers improved patient satisfaction without additional risk of complications.

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Conflicts of interest

There are no conflicts of interest.

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