

Small Incision Parotid Surgery

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Abstract:

Objective: To show utility of small incision (4 cm or less) in parotidectomy where incision is purely cervical.

Study design: Prospective study.

Setting: Tertiary care centre.

Materials and Methods: In the study period of 7 years, from July 2008 to June 2015, 40 patients were included in this study, and were considered pre-operatively for possible attempt to perform minimally invasive small incision parotidectomy. All these patients with parotid swelling were included based on ultrasound and fine needle aspiration cytology. The exclusion criteria were malignancy, involvement of skin, facial nerve palsy and patients with tumour size more than 5 cm in one diameter.

Conclusion: Small Incision Parotid Surgery (SIPS) can be a good procedure, if used judiciously, even for deep lobe tumour with proper visualization of the facial nerve, may prevent Frey's syndrome producing a very good aesthetic outcome.

Keyword: Parotidectomy, Small Incision, Extra Capsular Dissection, Frey's Syndrome, Cervical Incision

I. Introduction

These are the days of miniaturization, so as in the field of head and neck surgery. The journey of parotidectomy was started by Heister in 1756. In the modern era, extra-capsular dissection in parotid surgery has got acceptance. In this paper, we tried to show the utility of small incision (4 cm or less) in parotidectomy where the incision is purely cervical.

Our aim here is to systematically review the literature on the purely cervical approach for parotidectomy, hence providing objective evidence for its use. We especially review literature for the safety, cosmesis & advantages of this approach, where available, in direct comparison with Blair's incision. The technical aspects of the procedure, candidacy for surgery, advantages, surgical time, limitations, and complications of this approach are also reviewed.

II. Materials And Method

This prospective study was conducted in Department of ORL & HNS, Gauhati Medical College & Hospital, a tertiary care centre in India. In the study period of 7 years, from July 2008 to June 2015, after exclusion, 40 patients were included in this study, and they were considered pre-operatively for possible attempt to perform minimally invasive Small Incision Parotidectomy. All these Patients with parotid swelling were included based on cytopathology. All patients were evaluated pre-operatively with ultrasound and fine needle aspiration cytology. Exclusion criteria were malignancy, involvement of skin and facial nerve palsy. We also did not include any patients with tumour size more than 5 cm in one diameter. All patients were operated by the author, who opted for attempt of small incision parotidectomy by purely cervical incision, with consent to proceed for extension incisions, as dictated intraoperatively. All patients were operated under general anaesthesia except one who was operated under local anaesthesia because of general anaesthesia risk owing to low cardiac ejection fraction below 30 %. Frozen section biopsies and facial nerve monitoring was not used during any of the surgery.

Technical Background

Parotid surgery is challenged by the facial nerve and traumatized by Frey's syndrome as per the completion of parotidectomy is concerned. We designed this small incision surgery by limiting the incision size up to 4 cm starting below the ear lobule in the cervical skin crease, as shown in fig. 1.

The skin flap is elevated to expose the sternomastoid muscle. The facial nerve emerges in the neck and can be well identified by using posterior belly digastric muscle and the mastoid tip. Most of the parotid tissue lies in between the mandible and mastoid tip. The parotid gland is mobilized free from the sternomastoid muscle, posterior belly of digastrics muscle, tragal cartilage and tympanomastoid fissure. The minimal amount of parotid tissue below the zygoma actually a detached part i.e. pars accessoria, rarely give rise to a parotid

swelling. The efferent secretomotor fibers to parotid comes through auriculotemporal nerve which turns around the condyle of mandible to supply parotid gland below the zygoma, hence avoiding the skin incision in the pre-tragal area defying the possibility of frey's syndrome.



Figure 1. Cervical Incision

Procedural Logistics

Understanding the relation of space and volume is the principle behind this approach. Parotid gland, a well circumscribed organ is anchored by the facial nerve. A good mobilization of the gland from the nerve can make it easy to remove the gland through a comparatively smaller incision. There are some neck spaces which can be used during surgery. Supra-digastric peri-parotid area is good enough to reach the facial nerve. Retro-mandibular para-sternocleidomastoid space is good enough to lodge the gland posteriorly while working anteriorly. Air space has no limit to utilize. On mobilizing the parotid gland anteriorly after identifying the sternocleidomastoid muscle and posterior belly digastric muscle and clearing them from parotid tissue one can create a good space in between the mastoid tip and angle of the mandible. If there is no release of the parotid gland from the skin anteriorly, a moderate pull on the incision anteriorly give enough space to go to the upper edge of posterior belly of the digastric and then to identify the facial nerve. The smaller exposure restricts the traction on the facial nerve before identifying it as the anchorage of the gland is not released from the surrounding to fall loose.

III. Results

A total of 40 patients were included in the study with male to female ratio of 1.3:1. Highest numbers of patients were from third and fourth decade. In all the cases, FNAC diagnosis was pleomorphic adenoma except a case of parotid cyst. Post operative histopathology confirmed all the cases of pleomorphic adenoma except one patient who was found to have adenoid-cystic carcinoma. Nine patients had the tumours above the angle of the mandible, rest were mostly involving tail of parotid.

Table 1. Case Details

Fnac	Ultrasound Of Parotid Region		Surgical Plan	Number Of Patients	Surgery Executed	Post Operative Histo-Pathology
	Size	Location				
Pleomorphic Adenoma	Less Than 5cm	Supeficial Lobe	Superficial Parotidectomy	38	Superficial Parotidectomy	Pleomorphic Adenoma
Pleomorphic Adenoma	Less Than 5cm	Supeficial Lobe	Superficial Parotidectomy	1	Near Total Parotidectomy	Adenoid Cystic Carcinoma
Parotid Cyst	Less Than 5cm	Supeficial Lobe	Superficial Parotidectomy	1	Superficial Parotidectomy	Parotid Cyst

All patients had successful parotidectomy using the smaller cervical incision alone without any need for extension. The procedure done was superficial parotidectomy in all the patients, except in one patient where near total parotidectomy was done. All patients of small incision parotidectomy were hospitalized for 48 hrs on average except one patient who stayed for 7 days for hematoma. In 14 patients, we could come out without putting a drain and sending patient less than 48 hrs from the hospital, one of whom had sialocele needing long time to recovery. There were 8 patients with mild mandibular nerve paresis which recovered within 4 weeks. One patient had grade III paresis which took around 6 months for recovery, was a case of recurrent disease. There was no permanent nerve palsy.

All of the patients are under follow-up till date with a minimum duration of 1 year to maximum of 8 years. Follow-up of patients showed one case of frey's syndrome, who presented after 2 years of surgery sweating in the area below the angle of mandible & found to be obscured from view from the front side. There were only two recurrences; one at 11th month and the other at 2 years. These were patients of recurrent

pleomorphic adenoma with a recurrence free period of 6 yrs in both cases and were operated by other surgeon earlier. The recurrences were pre-tragal in both the cases. Post operative biopsy in both the patients did not commented on any margin positivity or capsular rupture.

Table 2. Complications

Complication	Number Of Patients	Percentage (%)
Transient Facial Palsy (Mandibular)		
Less Than Grade Iii	8	20.0
Grade Iii Or More	1	2.5
Permanent Facial Palsy	0	0
Sialocele	1	2.5
Hematoma	1	2.5
Frey's Syndrome	1	2.5
Recurrence	2	5.0



Figure 2. Intraoperative Photograph Showing Facial Nerve With The Tumour



Figure 3. Immediate Post Operative Photograph

IV. Discussion

As per record, the parotidectomy history started from 1818, by Carmichael of Dublin.

The anatomy of parotid gland is already well studied; the only issue to be realized is that there is very small amount of tissues near the zygoma which has got a thin rim of attachment to the main gland. This part of gland is termed as pars accessorius^[1] and is rarely the seed for a primary parotid tumour.

Regarding the auriculotemporal nerve, it is well established that it turns around the condyle of mandible to enter the pretragal area and divides into anterior and posterior branches behind the superficial temporal artery and vein to supply its secretomotor fibers to the gland.^[2]

Torres TS et al^[3] showed in their study of topographical and biometric evaluation of auriculotemporal nerve, superficial temporal artery and vein and tragus commented that avoiding manipulation of pre-tragal area helps in avoiding injury to auriculotemporal nerve.

The facial nerve though supplies the face it emerges in the neck and not in the face .hence no attempt was made to get the facial nerve incising the pre-tragal skin risking injury to auriculotemporal nerve and thus reducing the possibility of freys syndrome. A good cover by the parotid fascia after the surgery is always important to avoid freys syndrome.

The parotid fascia which is derived from the investing layer of the deep fascia neck has got its attachment to the zygomatic process at the top, but with an ill defined attachment in the pre-tragal area. The exploration of pre-tragal area may injure branches of auriculotemporal as well as breaches the continuity of parotid fascia which in turn may lead to freys syndrome.

The rates of frey's syndrome have been documented in various studies and are as high as 27%. These may be even higher if objective methods of assessment are used, with the discrepancy between this and subjective outcomes being up to 20%. These rates vary depending on the type of incision, amount of parotidectomy, plane of flap elevation, any reconstructive techniques used, and whether the outcome was subjective or objective; the beneficial effect of using any of these techniques for preventing frey's syndrome still remains controversial.^[4]

In recent years, a modification is made in the form of extra capsular dissection (McGurk et al 2003)^[5]. But the procedure discussed in this paper was not discussed earlier. In all the cases, we have avoided pre-auricular incision and were able to do successful superficial parotidectomy & even a near total parotidectomy which was evident by post operative radiological follow-up.

McGurk et al (1996)^[6] and Klintworth et al (2010)^[7] had showed the facial paresis to be 10.8% and 6.1% respectively. We have encountered one case of frey's syndrome in follow-up period of 8 yrs. In a country like india, many-a-times follow up is one of the main hindrances for study. But series of McGurk (1996)^[6] showed it to be 4.7 % and Roh et al (2007)^[8] showed it to be 5.8 % when extra capsular dissection was done, in comparison to 37.8% after doing superficial parotidectomy in McGurk series.

In this series, we had two recurrences. Both of the patients were of recurrent pleomorphic adenoma. The area of recurrence was pre tragal area; one after 11 months and the other after 2 years. The post operative report of the second surgery done by the senior author showed pleomorphic adenoma and biopsy did not showed any close margin to the capsule. McGurk et al (1996)^[6] showed the recurrence to be 2.1% after extra capsular dissection with a mean follow up of 12.6 yrs. Roh et al (2007)^[8] did not found any recurrence after superficial parotidectomy with a follow up of 2-5 yrs. Ghosh et al (2003)^[9] commented from series of 83 pleomorphic adenomas that a margin of 1 mm carries the risk of recurrence to be 1.8 %.

Natvig et al^[10] (1994) in their series of 346 patients who were diagnosed to be pleomorphic adenoma showed recurrences with rupture of capsule, visualization of capsule and non visualization capsule to be 8%, 1% and 2.5% respectively with a mean follow up of 8 years. They also compared margin status with recurrence. In the same series, positive or close margin, tumour cell growth through the capsule, negative margin and margin not described showed the recurrences as 2%, 1%, 2% and 1 % respectively.

Henriksson et al^[11] (1998), a swedish series of 197 parotid pleomorphic adenoma surgery, showed the recurrence with macroscopic rupture of capsule and uncomplicated group showed as 7% and 4%.

Alajmo et al^[12] (1998), the italian series of 239 patients showed 2% multi-centricity in pleomorphic adenomas which is the only study available in the literature and failed to get acceptance. Hence, the recurrence of parotid adenoma is apparently independent of amount of normal tissue removal if a rim of normal tissue is removed all around.

Renahan et al^[13] (1996) in a large series of 114 patients of recurrent pleomorphic adenomas from Christie Hospital showed the recurrence to be around 15%. They also showed the second recurrence as per surgical procedure as - extra capsular dissection-13%, superficial parotidectomy-15%, total parotidectomy-19% and parotidectomy with facial nerve sacrifice as 17 %.

The two second recurrences in our study were independent of the surgical procedures; probable cause may be the seeding of the surgical field during the primary surgery.

Fourteen of all the patients, we could send home without drain as the tissue handling was minimal and we could appose the parotid fascia to in all but two patients. One of those had sialocele needing long time for recovery. The only patients of frey's syndrome, the site of perspiration was in the neck at the site of incision. On retrospective analysis we realized the fascia closure was not adequate in this particular patient.

There were certain factor affecting successful completion of small incision parotidectomy by the approach described in this work which includes size of tumour, location of tumour and difficulty of dissection. The small incision approach has adequate exposure for benign tumours especially in superficial lobe of the parotid gland, and can also be used satisfactorily for deep lobe tumours. Dissection in the deep lobe is technically more demanding. This approach is not suitable for malignant tumours with or without skin, facial nerve or skull base involvement, or parapharyngeal extension which a much radical surgery and a much wider resection margin are necessary.

The author is continuing this work further to evaluate finer aspects of the described work. There were certain limitations in this study. Further research with more number of patients is required to better look for the short fall of the procedure. The follow-up period needed to be longer to look for recurrence and late occurrence of freys.

V. Conclusion

Small incision parotid surgery (SIPS) can be a good procedure, if used judiciously, even for deep lobe tumour with proper visualization of the facial nerve, may prevent frey's syndrome with a very good aesthetic outcome.

Compliance With Ethical Standards.

Conflict Of Interest – None.

Funding – None.

Informed Consent Obtained.

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