ORIGINAL ARTICLE

An Audit of Parotidectomy in Singapore: A Review of 31 Cases

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Summary

A series of 31 consecutive parotidectomies was evaluated. FNAC could differentiate tumour from non tumour in 72.8% of cases. For actual histology, FNAC was correct in 66.6%. Frozen section was correct in differentiating between benign, malignant and inflammatory conditions in all cases. Eighty-eight percent of frozen section histology concurred with final histology. The immediate postoperative period had 13 cases of facial nerve dysfunction, but only 3 cases had residual weakness. The branch most commonly affected was the mandibular branch (92.3%). Two patients had Frey's syndrome and one had a traumatic neuroma. FNAC and CT scans improve preoperative planning, providing histological evidence and the extent of the lesion.

Key Words: Parotidectomy, Complications, Audit, Facial nerve

Introduction

The major salivary glands include the parotid, submandibular, and sublingual glands. In addition, there are approximately 600 to 700 minor salivary glands distributed throughout the upper aerodigestive tract.

A study of 2807 patients at Memorial Sloan Kettering showed that seventy percent of salivary gland tumors arise from the parotid gland[1]. Fortunately, three quarters of these are benign. Of parotid tumors, 90% originate in the superficial lobe of the parotid and only 10% arise from the deep lobe itself. By far, the most common benign lesion was pleomorphic adenoma (84% of all benign tumors). Warthins tumor made up 12%. As for malignant tumors, mucoepidermoid carcinoma, adenoidcystic carcinoma and adenocarcinoma made up 72% of all malignant tumors.

There is little local data on parotid surgery. This article serves to provide some figures as a guideline to the use of investigations and complications in parotidectomy.

Materials and Methods

During a period from January 1994 to April 1998, 30 consecutive patients from a single ENT department who underwent parotidectomy were reviewed, with 1 patient having surgery to both parotid glands. Mean age of presentation was 50 years (range 24 - 84 years). This series included 14

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females (46.7%) and 16 males (53.3%). Patients were reviewed with respect to presentation, investigation, treatment and complications.

Results

Presentation

All 30 patients presented with a mass. Pain was also present in 5 patients. About half the patients (55.3%) were symptomatic for more than 12 months at the time of presentation. One patient had bilateral masses at presentation.

Investigations

CT scan
Twenty-eight of the 31 cases had CT scan of the parotid performed and reported by the radiologist prior to surgery.

FNAC
Twenty-three patients had preoperative fine needle aspiration cytology (FNAC), with one patient undergoing FNAC twice. Two cases had insufficient cells for diagnosis, leaving correlation with final histology available in 21 patients. The patient who underwent two FNAC procedures had an initial FNAC result of Warthin's tumour. The subsequent FNAC was suggestive of sialadenitis and final histology showed a normal gland.

The diagnostic capability of FNAC was reviewed, in particular, the ability to differentiate neoplastic (benign or malignant) from non neoplastic lesions. This was correct in 72.8%.

In terms of actual histological diagnosis, FNAC was correct in 66.6%. (Table I)

Frozen Section
Frozen section was performed in 25 of the 31 cases. With respect to differentiating between benign, malignant and inflammatory lesions, frozen section was 100% accurate, identifying 20 benign, 2 malignant and 3 inflammatory lesions.

For the comparison of frozen section histology with final histology, overall accuracy was 88%, with 22 of the frozen section diagnosis being the same as the final histology (Table II). Table III shows the total final histology.

Treatment

Of the 31 parotidectomies, there were 8 total parotidectomies (25.8%) and 23 superficial parotidectomies (74.2%). All the total parotidectomies had facial nerve preservation with the deep lobe removed from underneath the branches of the facial nerve after an initial superficial parotidectomy.

There were 3 total parotidectomies each for pleomorphic adenoma and inflammatory disease and 1 each for mucoepidermoid tumour and an intraparotid lymph node which showed undifferentiated carcinoma. No cases required neck dissection.

The overall median operating time was 170 minutes (range 95 - 360 mins). The median operating time for total parotidectomy was 270 minutes (range 205 - 360) and that for superficial parotidectomy being 150 minutes (range 95 - 250 mins).

The average length of hospital stay was 3.2 days (range 1 - 6 days). All cases had a vacuum drain inserted, which was removed after an average of 3.1 days.

Complications

At the first postoperative follow up, 13 of the 31 cases (41.9%) had facial nerve dysfunction, which included all 8 total parotidectomies performed. At the end of the period under review on 30th April 1998, only 3 had residual facial nerve weakness (9.7%). However, these 3 cases had only been on follow up for 21, 25 and 53 days respectively. All the others recovered full function after an average of 20 weeks.

Severity of facial nerve dysfunction at the first follow up visit was graded according to the House and Brackmann system (Table IV).

Table V shows the incidence of initial post operative facial nerve dysfunction by histological type and extent of surgery.

All the total parotidectomies done (n=8) had postoperative facial nerve dysfunction while only 5 of the 23 superficial parotidectomies (21.7%) had this problem.

The branch that was most commonly affected was the mandibular (92.3%), followed by the zygomatic (53.9%), buccal (30. 8%) and temporal branch (15.4%).

Two patients had Frey's syndrome occurring at 9 and 20 months after surgery. They were treated conservatively.

There were 2 cases (6.5%) that developed a seroma, both of which resolved after aspiration and 1 patient returned with a traumatic neuroma 17 months after the initial surgery.

There was no recurrence of tumour or deaths in any of the cases. None of the patients had complications of postoperative haematoma, salivary fistula, skin necrosis or keloid formation.

Table I : Significant FNAC vs final histology

FNAC diagnosis	Histological diagnosis
Sialadenitis (3 cases)	Warthins tumour
Benign tumour	sialadenitis
Sialadenitis	normal gland
Warthins tumour	normal gland

Table II: Accuracy of frozen section compared to final histology

Frozen section diagnosis	Correct	Incorrect	Total
Pleomorphic adenoma	12	1	13
Warthins tumour	6	1	7
Mucoepidermoid tumour	1	0	1
Sialadenitis	2	0	2
Lymphoepithelial lesion	1	0	1
Equivocal	0	1	1
Total	22	3	25

Table III: Final histology for all cases

	Final histology
Pleomorphic adenoma	14
Warthins tumour	6
Sialadenitis	5
Monomorphic adenoma	1
Oncocytoma	1
Mucoepidermoid carcinoma	1
Undifferentiated carcinoma	1
Normal gland	1

Table IV: Severity of facial nerve dysfunction at the first follow up appointment

Grade*	Number
I	0
II	7 (53.9%)
III	3 (23.1%)
IV	1 (7.7%)
V	0
VI	2 (15.4%)

*House and Brackmann grading

Table V: Incidence of initial post -operative facial nerve dysfunction by histological type and extent of parotidectomy

Histology	Number	Extent of parotidectomy
Pleomorphic adenoma	5/14 (35.7%)	3 total, 2 superficial
Warthins tumour	3/6 (50.0%)	3 superficial
Sialadenitis	3/5 (60.0%)	3 total
Mucoepidermoid tumour	1/1 (100%)	1 total
Metastatic NPC	1/1 (100%)	1 total

Discussion

Frozen section was performed in most of the cases. It had a 100% accuracy for differentiating between benign, malignant and inflammatory lesions and 88% accuracy for the actual histological diagnosis. Other series have reported lower rates of 95.4% and 51% respectively[2].

Our figures suggest that FNAC is yet to be comparable to frozen section diagnosis, obtaining an accuracy of only 72.8% compared to 100% when identifying tumour. Other studies show similar diagnostic rates for FNAC and frozen section[2]. In institutions where FNAC diagnostic accuracy is comparable to frozen section, there may not be a need to perform routine frozen section. However, based on our local figures, we should base our extent of resection on frozen section, and not FNAC. The role of the cytologist is crucial when using FNAC.

However, in our series, incorrect FNAC diagnosis would not have changed the management in all the cases where they were incorrect except for the case where the gland was found to be normal.

Our series had a median operating time of 170 minutes. This is considerably longer than the 66 minutes quoted by Deans et al[3]. However in that series, operations included less extensive surgery of ductoplasty (20%) and enucleation (12%), unlike our series which were limited to superficial and total parotidectomies. Furthermore total parotidectomies consisted of only 18% of all their operations compared to 26% in our series. Also, we should take into account time needed to await frozen section histology.

Mean hospital stay was 3.2 days. This compares very favourably to another audit by Deans et al[3] which had a median stay of 5 days. Forty-two percent of our cases had some initial facial nerve dysfunction. Other series have rates of between 8.8% to 74.1% [3-8].

Not surprisingly, initial facial nerve dysfunction was much higher in the total parotidectomy group, (100%), compared to the superficial parotidectomy group (21.7%). Only 9.7% of our cases had residual facial nerve weakness. Furthermore, the 3 cases were still in the early postoperative period,

being assessed after only 21, 25 and 53 days respectively, well before our average recovery time of 20 weeks.

For comparison, a series of 229 pleomorphic adenomas had permanent paralysis of 3.9% even after at least 2 years of follow up[8]. The Cleveland Clinic reported a 3.9% postoperative facial nerve dysfunction of 6 months or more in their series of 256 benign tumours[5]. Another study reported permanent weakness of 5.6% after at least 2 years of follow up[7].

There was one patient where a small branch of the facial nerve had to be sacrificed. Primary repair was performed and there was complete recovery in 24 weeks. The experience of other surgeons showed permanent weakness in 100% of cases where the nerve was sacrificed[3,4].

Similar to other series, the mandibular branch was the most commonly affected (92.3%)[4,5,6,8]. This is thought to be due to the relatively long course of the nerve, its smaller diameter and its lack of anastamotic connections. Our second most common branch involved was the zygomatic (53.9%). This contrasts with the Cleveland Clinic and Laccoureye's series where the buccal branch was the second most common branch affected[5,8]. The zygomatic branch was only involved in 7.7% of the cases at the Cleveland Clinic.

As expected, a higher percentage of sialadenitis patients presented with pain. The percentage of patients with sialadenitis having postoperative facial nerve weakness is also particularly high (60%), reflecting the technical difficulties of surgery in a fibrotic and inflamed gland. O' Brien's review of 242 parotidectomies also had a relatively higher incidence of postoperative facial nerve weakness in sialadenitis cases[4]. Similarly, this was also shown by Bron and O' Brien's study[9].

Two patients (6.4%) had Frey's syndrome presenting with it after 9 and 20 months respectively. This compares well to 6%, 13% and 65.9% in other series[3,8,10]. We had one patient (3.2%) who returned with a traumatic neuroma. Comparatively, Laccoureye's series had 15.7%[8]. There was no incidence of any parotid fistula but Laskawi et al reported a 4% incidence in his series of pleomorphic adenomas[10].

Conclusion

Parotid surgery has many potential complications. The facial nerve is the main concern in parotid surgery. Fine needle aspiration assists preoperative planning by providing probable histology. In this series, we hope to provide a local baseline for subsequent reviews of parotid surgery.

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