



Incidence and documentation of ear lobe numbness after parotidectomy: our 20 years' experience

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Abstract: Introduction: Parotidectomy carries a risk of postoperative complications including facial nerve palsy and Frey's syndrome. Less attention, however, has been given to the management of the greater auricular nerve (GAN) during parotidectomy. Providing sensory supply to the auricle, the greater auricular nerve is often sacrificed for access to the parotid gland during surgery. This results in anaesthesia and paraesthesia of the ear lobe and significant patient morbidity.

Aim: To review the electronically available documentation of post-parotidectomy ear lobe numbness in our follow-up clinic letters of the past 20 years.

Methods: For this retrospective case series our departmental database of over 850 patients undergoing parotidectomy was used as the primary data source. The information collected from electronic records included documentation of intraoperative details, post-operative recovery and incidence of ear lobe numbness post-operatively. The current study was completed between October and November 2020. SPSS and Excel were used for data collection and analysis.

Results: The incidence of ear lobe numbness was found to be higher in the patient cohort whose posterior branch of the GAN had been sacrificed during surgery (58% compared to 46%). This agrees with the published literature that preservation of the posterior branch of the GAN decreases the post-operative sensory deficit to the auricle. However, this audit was limited by the incomplete recording of GAN sacrifice intra-operatively and post-operative GAN dysfunction.

Discussion: As any tissue removed, added or altered in surgery requires accurate record-keeping, the outcome of the greater auricular nerve during parotidectomy should always be included in the operation notes. A proforma made available within the department may allow for a standardised recording of recognised complications.

Keywords: Parotidectomy, Audit, Ear Lobe, Surgery, Greater Auricular Nerve, Operation, Documentation

Key learning points

- The incidence of ear lobe numbness is higher where the posterior branch of the greater auricular nerve is sacrificed during surgery (58% compared to 46%). This agrees with the currently available literature.
- Operation notes should include sufficient detail on any tissue that is removed, added or altered. As a result, the greater auricular nerve outcome should be recorded during a parotidectomy.
- Actions should be implemented to standardise the recording of recognised complications within the department.

- Accurate departmental records regarding ear lobe numbness following parotidectomy will provide patients with department-specific frequency statistics that may be used to improve pre-operative discussion and informed consent prior to parotidectomy.

1. Introduction

Parotidectomy describes the partial or total surgical removal of the parotid gland [1]. The parotid gland is the largest salivary gland of the human body secreting serous fluid into the oral cavity [2].

As with any surgical procedure, parotidectomy is not without risks [1]. Injury to the facial nerve,



including its marginal mandibular branch, as well as Frey's syndrome (commonly known as gustatory sweating) are the most well-known complications following parotid surgery [2]. As a result, most surgical techniques for the treatment of parotid disease involve careful excision of the pathology in question while preserving and monitoring the facial nerve throughout [3]. This specific importance to the facial nerve is attributed to the severe functional, motor and cosmetic deficits that come with such nerve palsy [3].

Less attention has been given to the management of other key structures in relation to the parotid gland. The prime example of this is the greater auricular nerve (GAN), whose anterior and posterior branches are often sacrificed for access to the parotid gland during surgery [4]. The GAN, a branch of the first and second spinal nerves of the cervical plexus, is the primary sensory supply to the auricle [2]. For this reason, the resulting anaesthesia and paraesthesia of the ear lobe in particular following parotidectomy are significant causes of morbidity in this patient cohort [5]. The functional deficit resulting from the sacrifice of the GAN during surgery includes difficulty in answering the telephone, shaving or wearing earrings [6]. Ear lobe numbness also predisposes patients to trauma due to the absent sensation [6].

Aims

To audit the electronically available documentation of post-parotidectomy ear lobe numbness in our patients treated over the last 20 years.

GAN status mentioned in electronic operation notes was the primary outcome and the corresponding electronic clinic letters recording ear lobe numbness were the secondary outcome.

Patients and Methods

Our departmental database of over 850 patients undergoing parotidectomy in the past 20 years was used as the primary data source. The database was comprised of individual parotidectomies with their corresponding patient data, which included patient demographics, details relating to their surgery, such as date of operation and date of admission to hospital along with post-operative complications.

Data collection and data analysis were carried out using TrakCare® Patient Management System and Microsoft® Excel 2018, respectively. The current

retrospective case series was undertaken between October and November 2020.

Patient demographic information and unique patient identifier numbers were entered into TrakCare®. Operation notes as well as follow-up clinic letters were sought for each parotidectomy.

During data collection it was found that operation notes were often stored under "anaesthetic records"; these were reviewed for all patient data entries as additional scrutiny. All ENT clinic letters as well as hospital discharge letters were reviewed in detail to obtain any relevant data. Moreover, allied surgical specialties, such as Oral and Maxillo-Facial Surgery correspondence, was reviewed when ENT letters were unavailable on TrakCare® Patient Management System.

Results

A total of 885 single data entries were provided in the departmental database. Following duplicate removal, a total of 829 data entries remained for further analysis.

Data could not be analysed for the 76% (631/829) of the parotidectomy database. The most common reasons for this were electronically unavailable ENT letters (475/631), incomplete or incorrect patient data making it impossible to locate the patients in TrakCare® (79/631) and unavailable data within TrakCare® (74/631). Three parotidectomies were withdrawn due to patient's refusal, a non-operative management strategy or regression of pathology. One operation was incorrectly recorded as a parotidectomy.

The remaining 24% (197/829) of the patients had enough information available in TrakCare® for detailed analysis. Of these, only 10% (81/829) had electronically available operation notes. No operation notes could be found for 14% (116/829) of the database (Figure 1).

Required post-operative clinical information was available for 197 (197/829 = 24%) patients: 44 (22%) patients reported ear lobe numbness during their follow-up appointments; and 10 (5%) patients denied any loss of sensation to the pinna.

The majority (138/197) of the clinic letters reviewed, however, did not document any data regarding ear lobe numbness. No ENT letters were available in only two (2/197) of this cohort. The remaining 3 patients (3/197) had undergone an



auricectomy, thus preventing any further analysis regarding ear lobe numbness.

After review of all 81 operation notes available, 70% (56/81) of them clearly stated the outcome of the GAN following a parotidectomy. Of this

70%, the GAN was preserved in 37 (37/56) operations and sacrificed in 19 (19/56), as shown in Table 1.

In the remaining 30% (25/81) operation notes the GAN status was not mentioned.

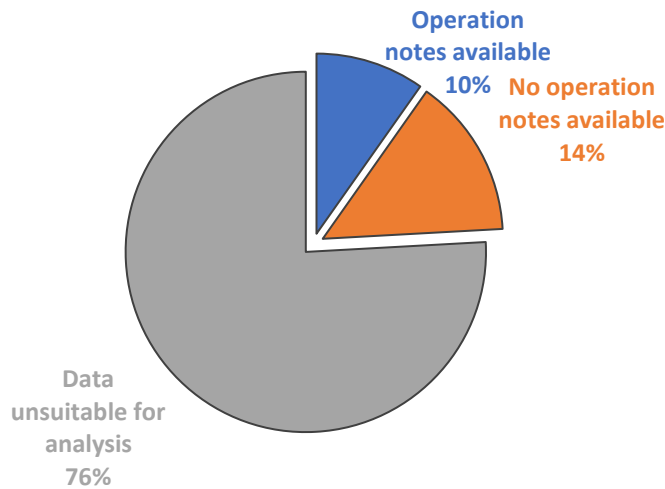


Figure 1. Electronic availability of operation notes.

Table 1. GAN status and ear lobe numbness following parotidectomy

GAN mentioned in operation notes (56/81)			
GAN sacrificed (19/56)		GAN preserved (37/56)	
Anterior branch	1	Anterior branch	0
Posterior branch	1	Posterior branch	19
Unspecified	17	Unspecified	18
Numbness (19/56)		Numbness (37/56)	
Yes	11	Yes	17
No	1	No	7
Not mentioned in correspondence	7	Not mentioned in correspondence	13
GAN not mentioned in operation notes (25/81)		No operation notes available (116/829)	
Numbness		Numbness	
Not mentioned in correspondence	19	Not mentioned in correspondence	99
Yes	4	Yes	12
No ENT letters available	2	No	2
		N/A	3



When the GAN had been sacrificed, ear lobe numbness was reported in 58% (11/19) of cases as documented in clinic letters. Ear lobe sensation was intact in only one patient (1/19), however for 37% (7/19) of the available operation notes there was no mention of ear lobe paraesthesia or anaesthesia in the respective follow-up clinic letters following the operation (Table 1).

When the GAN had been preserved during surgery, ear lobe numbness was reported in 30% (17/37) of patients' clinic letters. Ear lobe was instead sensate in 19% (7/37) of patients whose GAN had been preserved. Ear lobe sensation, or lack thereof, was not reported in 35% (13/37) of electronic clinic letters available (Table 1).

For those operation notes with no mention of the GAN status, numbness of the pinna was subsequently reported in 4 (4/25) patients clinic letters. The remaining data was either not mentioned in any of the follow-up clinic letters (19/25) or not available on the Patient Management System TrakCare® (2/25) (Table 1).

When no operation notes were available on TrakCare® (116/829), clinic letters were reviewed to assess pinna sensation post-parotidectomy. Ear lobe numbness was reported in 10% (12/116) of patients, whereas intact sensation constituted only 2% of the analysed letters (2/116). The majority of follow-up clinic letters (85%, 99/116) did not provide any information regarding any sensation to the pinna. Finally, 3 patients (3/116) had undergone an auricectomy, thus making them unsuitable for data analysis.

When the GAN had been sacrificed during parotidectomy, the incidence of ear lobe numbness recorded in clinic letters was calculated to be 58% (11/19), as opposed to the 46% (17/37) incidence of ear lobe numbness derived from the patient cohort whose GAN had been preserved. Pinna sensation had been preserved in 5% (1/19) and 19% (7/37) of those whose GAN had been compromised and preserved respectively. In 37% (7/19) of patients with no longer a GAN, no mention had been found in their clinic records of ear lobe numbness. Similarly, 35% (13/37) of those with a remaining GAN after parotidectomy had no records about sensation to their ear.

Discussion

Numbness of the ear lobe after parotidectomy can occur after iatrogenic trauma to the greater auricular nerve. Preservation of the anterior branch of the GAN is often challenging as its anatomical position over the tail of the parotid gland prevents exposure of the gland when a skin flap is raised [7]. The posterior branch, instead, can be safely and effectively preserved by careful dissection, with the assumption that the posterior lobe of the parotid where this branch lies is not involved with tumour [8]. Preservation of the GAN improves sensitivity to the pinna and promotes rapid regeneration of sensory function post-operatively, thus greatly increasing a patient's quality of life [9].

In our study, the incidence of ear lobe numbness was found to be higher where the posterior branch of the GAN had been sacrificed during surgery, as opposed to when it had been carefully preserved (58% compared to 46% respectively). These results agree with the published literature that preservation of the posterior branch of the GAN decreases the post-operative sensory deficit to the auricle and the subsequent functional sequelae that arise when the nerve is sacrificed during parotidectomy [10].

Accurate and complete documentation of patients' medical records, including operation notes, is key not only for the management of the post-operative period, but also from a medico-legal standpoint.¹¹ A patient undergoing surgery is often looked after by members of the healthcare team that were not present during the procedure itself. Therefore, clear instructions regarding the post-operative management are necessary for excellent continuity of care and a smooth and quick recovery.¹¹ While GAN dysfunction carries little functional deficit in clinical studies, high quality record-keeping is a legal requirement and may safeguard clinicians during litigation [11].

According to the Royal College of Surgeons of England's standards of *Good Surgical Practice*, surgeons must ensure records are kept clear, legible and accurate [12]. Specifically, operation notes should include sufficient detail on any tissue that is removed, added or altered [12]. Based on the aforementioned guidelines, it is therefore fundamental that a surgeon records the outcome of the GAN during a parotidectomy.

According to the departmental data analysed, only 31% (25/81) of the electronically available



operation notes had clearly recorded whether the GAN had been sacrificed or preserved.

This audit has identified that, within the department, record keeping with regards to GAN dysfunction should be improved to meet the standards of *Good Surgical Practice* [12].

The majority of the database (76%, 629/829) could not be meaningfully used to review post-operative complications, mostly due to unavailable letters and incorrect input of patient information. Unavailable letters may be attributed to the relatively recent introduction of TrakCare® and missing letters might be filed in hard copies of patient records. Future audits may wish to investigate the hard copy patient records to see whether operation notes and letters are available, in order to ultimately produce a more comprehensive analysis of the data.

Conclusions

Based on our data, it would appear that the incidence of ear lobe numbness is higher where the posterior branch of the GAN is sacrificed during surgery (58% compared to 46%).

However, this audit was limited by the incomplete recording of GAN sacrifice intra-operatively and post-operative GAN dysfunction.

Suitable actions should be implemented to improve the recording of recognised complications within the department. The operation notes should include sufficient detail on the greater auricular nerve status during parotidectomy. Consideration should be given to a locally implemented proforma or policy to ensure there is a standardised way of reporting intra-operative and post-operative findings.

The sensory status of the ear lobe should be clearly recorded when patients are reviewed in the clinic post-operatively. Comprehensive and accurate records regarding ear lobe numbness following sacrifice of GAN intra-operatively will provide patients with department-specific frequency statistics that may be used to improve pre-operative discussion and informed consent prior to parotidectomy.

Future research should focus on the progress or regression of anaesthesia and hypoaesthesia of the pinna post-parotidectomy. This can be done in person during follow-up clinics or by means of a patient-centered questionnaire where patients are asked to map out to the best of their abilities the area of skin with altered or loss of sensation. Patients may be

asked specific questions about any potential recovery of sensation as well as any impact on their quality of life this functional deficit may have caused.

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Ethics Approval

The study was approved by the departmental and institutional clinical effectiveness department.

Conflict of interest

The authors declare no conflict of interest.

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