Is routine histological tissue sampling during endoscopic dacryocystorhinostomy advantageous? A retrospective analysis of 213 patients

1 | INTRODUCTION

The prevalence of tumours of the lacrimal duct system is very low (1.43%). Tumours developing in this region cover a large spectrum of entities that fall into two categories: primary epithelial neoplasms and primary non-epithelial neoplasms. The typical symptoms of a dysfunction of the lacrimal duct system, such as epiphora, secretion and swelling of the lacrimal sac, can be caused by stenosis or inflammation as well as by benign and malignant proliferative diseases of the tear duct system. Malignant disease must always be suspected when there are clinical signs such as telangiectasias over the swelling and serous-sanguineous secretion. Besides primary tumours, in rare cases, metastases or secondary tumours can also develop in the lacrimal duct system. In most cases, neoplasms of the tear duct system are detected very late and often accidentally.

To restore patency to a stenotic lacrimal duct system in patients who present with chronic or intermittent epiphora, endoscopic dacryocystorhinostomy (DCR) can be considered as the golden standard of treatment. In our department, tissue was not routinely sampled for histological examination during endoscopic DCR. In the literature, the relevance of routine lacrimal sac biopsy is discussed controversially, although malignant proliferative disease cannot be excluded with certainty without histological examination. Merkonidis et al. show that a biopsy is only necessary if diseases other than chronic inflammation are suspected pre- or intraoperatively. In contrast, Koturovic et al. postulated that a routine biopsy of the lacrimal sac is highly valuable, as a previously suspected diagnosis can be confirmed or unexpected diseases revealed without further inconvenience to the patient.

2 | MATERIALS AND METHODS

In this study, we analysed data from all 364 patients referred to the Department of Otorhinolaryngology at the Medical University of Graz who underwent endoscopic DCR between June 2001 and April 2015. The referral diagnoses were always inflammatory and/or stenotic diseases of the lacrimal duct system. Preoperative clinical and/or radiological examinations showed no signs of tumours.

The aim of this retrospective study was to determine the usefulness of routine tissue collection during surgery for histological examination. On the basis of the histopathological reports, we calculated the rate of incidental findings of an occult benign or malignant tumour that was not suspected before or during surgery.

2.1 | Ethical considerations

The study was approved by the institutional review board of the Medical University of Graz (approval number: 27-192 ex 14/15) and complies with the Declaration of Helsinki.

2.2 | Statistical analysis

The data underwent descriptive and frequency distribution analysis with SPSS (IBM SPSS Statistics 23). The Kolmogorov-Smirnov test was performed to test for normal distribution. The following parameters were analysed with cross-tabulation: tissue samples (yes/no) and incidental findings of benign or malignant proliferative disease (yes/no).

3 | RESULTS

All DCRs (N = 364) were statistically analysed. The majority of patients were female (N = 240, 65.9%); the average age of all patients was 56 years (SD: 22 years), and the average follow-up period was 13.1 months (SD: 23.7 months). The most frequent pre-surgical diagnosis was acquired dacryostenosis (70.1%; 255 patients); acute dacryocystitis was suspected in 46 patients (12.6%) and the chronic form in 47 (12.9%). The remaining less frequently suspected diagnoses were dacryolithiasis, dacryocele, lacrimal sac abscess, epiphora and orbital phlegmon. In none of the referred cases was a tumour suspected prior to surgery.

During surgery, tissue samples were taken from 213 of 364 patients and examined histologically (58.5%). In the remaining cases (151, 41.5%), no tissue was excised as the nasolacrimal sac was only opened, without partial resection of its medial wall. This was because various surgeons had used different techniques in this retrospective study. Proliferative disease was detected in five (2.3%) of
the 213 patients whose specimens were examined histologically. The five tumour entities were as follows: one malignant nasal natural killer/T-cell lymphoma, two malignant extranodal marginal zone B-cell lymphomas, one poorly differentiated non-keratinising squamous cell carcinoma and one benign solitary fibrous tumour. The following therapies for the five patients with benign or malignant proliferative disease were individually planned:

The patient suffering from the natural killer/T-cell lymphoma was treated with CHOP chemotherapy and radiation after the DCR, which achieved 17-month recurrence-free survival. After tumour recurrence, the patient received palliative care before succumbing to the malignant disease.

Both patients suffering from an extranodal marginal zone B-cell lymphoma underwent radiation without recurrence in the follow-up period. The first patient was radiated with a total dose of 36 gray, the second with a total dose of 60 gray.

The patient with the solitary benign fibrous tumour of the lacrimal sac underwent extended surgery to excise the entire tumour and showed no recurrence in the follow-up period.

The patient with the poorly differentiated non-keratinising squamous cell carcinoma required radical surgery and radiation with a total dose of 60 gray, followed by 10-month recurrence-free survival. Documentation did not indicate death due to the malignant disease.

4 | DISCUSSION

Among 213 patients who underwent endoscopic DCR as well as intraoperative tissue sampling and in whom a proliferative disease was not suspected before surgery, histology uncovered five (2.3%) incidental pathological findings.

Although our rate is low compared to other studies, our hypothesis that tissue sampling during DCR allows incidental histological detection of proliferative disease was confirmed. In Denmark, between 1910 and 1999, Marthin et al.9 analysed 643 tissue samples and found a rate of tumorous diseases of 4.5% (29 tumours). Heindl et al.10 determined a rate of proliferative diseases of 2.53% (12 tumours) in 474 patients at the Department of Ophthalmology at the Friedrich-Alexander-University in Erlangen, Germany. Tanweer et al.3 postulated a rate of 0.76% (4 neoplasms) in 525 patients.3,9,10 Koturovic et al.8 postulated that a routine biopsy of the lacrimal sac is of high value as a previously suspected diagnosis can be confirmed or unexpected diseases revealed without inconveniencing patients. Given the considerable rates of incidental tumour findings, biopsies should always be taken, even during revision surgeries. For tonsillectomies, Booth et al.11 described an incidental finding of occult haematologic disease with a rate of 0.5%, thus justifying routine histological work-up after tonsillectomy.

Considering the whole study population (N = 364), the rate of incidental tumour finding would be 1.4%, given the fact that the patients without intraoperative tissue sampling did not show a tumour in the follow-up period. A shortcoming of the study is its retrospective character. Upon analysis of the surgical reports, we found that no nasolacrimal mucosa was harvested for histology when the surgeon had only opened the nasolacrimal sac without partially resecting its medial wall. However, in the other 213 patients, in whom the nasolacrimal sac was partially resected medially and the mucosa marsupialised with the nasal mucosa, the harvested tissue was sent for histology. In none of these cases did the surgeon suspect a proliferative disease intraoperatively.

5 | CONCLUSION

In spite of the relatively low overall prevalence of malignant tumours of the nasolacrimal duct, the rate of incidental tumour findings in the present study justifies routine histological work-up, particularly as tissue sampling during DCR does not in any way inconvenience the patient.

CONFLICT OF INTEREST

None to declare

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Keypoints

- Histological work-up after DCR can reveal malignant or benign tumours.
- Primary referral diagnosis of dacryocystitis or dacryostenosis can be wrong, delaying proper therapy for the patient with incidental finding of malignancy.
- Routine histological work-up should be considered; if this is not possible, a longer follow-up should be planned.
The usefulness integrity testing in children: A single institution experience of 86 tests over a period of 20 years

1 | INTRODUCTION

Cochlear implants are widely accepted as the best management option for both adults and children with a severe-profound hearing loss who do not benefit from traditional hearing aid amplification. There are over 350,000 cochlear implant recipients worldwide and despite the very high reliability, these devices do occasionally fail. Internationally, device failure rates have been reported to vary between 3% and 5% in large centre studies.

An important part of every clinical programming session is the measurement of impedances, that is the level of connectivity between the electrodes and the neuronal tissue. This test allows clinicians to determine how many channels can be used for programming. If a problem develops, whether in the device itself or the device-tissue interface, an impedance test can be the first indicator of a device failure.

High electrode impedances imply open circuits, whereas very low impedances indicate short circuits. Both open- and short-circuited electrodes are non-functional and automatically flagged by the programming software.

Sudden or progressive changes in the impedances, as well as abnormal impedance profiles, can often be the first indication of a device malfunction. In these situations, an in-situ integrity device testing can determine if the device is still functioning within the manufacturer’s specifications or if its functionality has been compromised.

Frequently, there are also situations where, despite normal impedance profile, children might show a lack of clinical progress or refuse to use their speech processor. In these cases, device malfunction can be one of the underlying reasons for these clinical presentations and clinicians may request manufacturers to undertake an in-situ device integrity test.

In fact, as very young children may not yet have the language to express an anomaly in device function or sound quality changes, it may lead to device failure being undetectable for a significant period of time, which can cause further language development delays or lead to the ultimate rejection of the device.

The reasons to request an integrity test in children are classified as Clinical Performance Problems, when the child fails to meet clinical expectations, and Technical Problems, when there is a sudden or gradual increase on the number of atypical electrodes over time.

More specifically, Clinical Performance Problems can be divided into the following subcategories:

1. Lack of progress
2. Behavioural
3. Auditory problems

The integrity testing is performed at the endpoint of troubleshooting any suspected problem. The testing is conducted onsite by the manufacturer using specific equipment that can connect and assess the implant in-situ. It is a time-consuming process as it often requires an additional visit by the manufacturer to the clinic.