INDEX COPERNICUS INTERNATIONAL

ORIGINAL ARTICLE

The impact of accuracy of documentation of parotid tumor operative reports on secondary surgical intervention

Authors' Contribution:
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

Krzysztof Piwowarczyk[ABDEF], Ewelina Bartkowiak[ABDEF], Jadzia T. Chou[BEF], Katarzyna Kukawska[DEF], Ludwika Piwowarczyk[CDF], Małgorzata Wierzbicka[ABDEF]

Department of Otolaryngology and Laryngological Oncology, Poznan University of Medical Sciences, Poznan, Poland; Head: prof. Małgorzata Wierzbicka MD PhD

Article history: Received: 16.12.2020 Accepted: 29.12.2020 Published: 30.12.2020

ABSTRACT:

Aim: The accuracy of primary operative reports (OpR) was assessed based on a tertiary referral department's experience with reoperations of parotid gland tumors, in order to develop a comprehensive operative report schema.

Material and methods: The retrospective cross-sectional study was conducted at the Department of Otolaryngology and Laryngological Surgery, Poznan University of Medical Sciences, Poland. Out of 1154 surgeries performed over a 10-year period, 71 patients underwent reoperation. Their OpR were categorized into accurate and non-accurate, and the reoperation field and reoperation course were categorized as anticipated or unanticipated, according to the defined criteria. The main outcome measure was the impact of accuracy of the first OpR on reoperation course.

Results: In this series, OpR were 39% (14/36) accurate, 61% (22/36) non-accurate. Reoperation fields were 16% (11/71) anticipated, 37% (26/71) unanticipated. Reoperation courses were 37% (26/71) anticipated, 63% (45/71) unanticipated. An anticipated reoperation course followed 20% (5/26) of accurate and 20% (5/26) of non-accurate primary OpR. An unanticipated reoperation course followed 20% (9/45) of accurate and 40% (18/45) of non-accurate OpR. There is no significant relationship between the reoperation course and the accuracy of the first OpR [Chi2(1) = 0.69; p = 0.40466]. The most common variable that affected non-accuracy of the OpR was facial nerve function after surgery (6/12).

Discussion: The operative report should be based on transparent criteria, a robust classification and a comprehensive protocol. This will improve follow-up and facilitate the planning of reoperation.

KEYWORDS: facial nerve, parotid gland, reoperation, surgery, surgical complications, tumor recurrence

ABBREVIATIONS

ESGS – European Salivary Gland Society
OpR – operative report
PA – pleomorphic adenoma
PSP – partial superficial parotidectomy
rPBT – benign parotid gland tumor recurrence
SP – superficial parotidectomy

INTRODUCTION

Every surgery requires a unified classification and detailed procedural description, and this is especially true when the anatomy of the surgical field is problematic [1, 2]. A search of online databases reveals the rigor that surrounds operative protocol accuracy in breast [3], rectal [4], esophageal [5], kidney [6] oncological surgery, laparoscopic cholecystectomy and pancreaticoduodenectomy [7] and pediatric oncology [8], to name a few. The course of the reoperation, should one be needed, is independent of previous actions in the operated area. Particularly in the case of tumor relapse, surgical decisions and outcomes could be contingent upon the preceding procedure, and it goes without saying that success is highly dependent upon surgeon awareness of any deviations from the typical course of treatment, as well as familiarity with an estimated image of the previously operated anatomy. The ability to make an accurate estimate can have profound effects on the anticipated surgical course and the possible complications that may occur during and after reoperation [9, 10].

The treatment of the most pathological conditions and anatomical areas is bound by operative standards. Likewise, the classification of salivary gland surgeries has been well established by the European Salivary Gland Society (ESGS) [11]. The ESGS operative report (OpR) includes the glandular parenchyma level removed, designated by Roman numerals I to V, and the non-glandular structures removed. Wong and Shetty proposed a modification of parotid levels I and II and subdividing them into Ia, Ib, IIa, and IIb levels along the divisions of the facial nerve [12]. These sublevels have enabled the description of crucial points/key structures to be improved, increasing accuracy and clinical relevance. This meticulous description is intended to optimize the management of complications and plan post-treatment monitoring and reoperation, and serves to highlight the verifiable value of a robust classification and comprehensive protocol.

Tab. I. The correlation between the reoperation field and the reoperation course, and the variables and their p values.

	REOPERATION FIELD		P-VALUE	REOPERATION COURSE		P-VALUE
	Anticipated	**Unanticipated**		**Anticipated**	**Unanticipated**	
Primary OpR						
Accurate	11 (30.77%)	3 (7.69%)	0.00011	7 (20.00%)	7 (20.00%)	0.40466
Non-accurate	0 (0.00%)	22 (61.54%)		7 (20.00%)	14 (40.00%)	
Tumor location						
Accurate	11 (30.77%)	17 (46.15%)	0.17458	18 (33.33%)	20 (51.28%)	0.97232
Non-accurate	0 (0.00%)	9 (23.08%)		4 (7.69%)	4 (7.69%)	
Tumor size						
Accurate	11 (30.77%)	6 (15.38%)	0.00117	17 (30.77%)	20 (35.90%)	0.56496
Non-accurate	0 (0.00%)	20 (53.85%)		6 (10.26%)	13 (23.08%)	
Amount of removed parenchyma						
Accurate	11 (30.77%)	11 (30.77%)	0.02440	11 (30.77%)	11 (30.77%)	0.55100
Non-accurate	0 (0.00%)	14 (38.46%)		4 (11.54%)	10 (26.92%)	
Presence of satellite tumors						
Accurate	11 (30.77%)	9 (23.08%)	0.00651	13 (25.00%)	18 (36.11%)	0.90799
Non-accurate	0 (0.00%)	17 (46.15%)		9 (16.67%)	11 (22.22%)	
Distance from facial nerve trunk						
Accurate	11 (30.77%)	9 (23.08%)	0.00651	9 (20.00%)	13 (30.00%)	0.70939
Non-accurate	0 (0.00%)	17 (46.15%)		9 (20.00%)	13 (30.00%)	
Absence/rupture of capsule						
Accurate	11 (30.77%)	10 (26.92%)	0.01310	14 (32.26%)	13 (29.03%)	0.49575
Non-accurate	0 (0.00%)	16 (42.31%)		6 (12.90%)	11 (25.81%)	
Postoperative status of facial nerve						
Accurate	10 (19.23%)	10 (26.92%)	0.49117	13 (24.32%)	11 (21.62%)	0.15665
Non-accurate	4 (11.54%)	16 (42.31%)		9 (16.22%)	20 (37.84%)	
Primary OpR						
Accurate	11 (30.77%)	3 (7.69%)	0.00	7 (20.00%)	7 (20.00%)	0.40
Non-accurate	0 (0.00%)	22 (61.54%)		7 (20.00%)	14 (40.00%)	
Tumor location						
Accurate	11 (30.77%)	17 (46.15%)	0.17	18 (33.33%)	20 (51.28%)	0.97
Non-accurate	0 (0.00%)	9 (23.08%)		4 (7.69%)	4 (7.69%)	
Tumor size						
Accurate	11 (30.77%)	6 (15.38%)	0.00	17 (30.77%)	20 (35.90%)	0.56
Non-accurate	0 (0.00%)	20 (53.85%)		6 (10.26%)	13 (23.08%)	
Amount of removed parenchyma						
Accurate	11 (30.77%)	11 (30.77%)	0.02	11 (30.77%)	11 (30.77%)	0.55
Non-accurate	0 (0.00%)	14 (38.46%)		4 (11.54%)	10 (26.92%)	

	REOPERATION FIELD		P-VALUE	REOPERATION COURSE		P-VALUE
	Anticipated	Unanticipated		Anticipated	Unanticipated	
Presence of satellite tumors						
Accurate	11 (30.77%)	9 (23.08%)	0.00	13 (25.00%)	18 (36.11%)	0.91
Non-accurate	0 (0.00%)	17 (46.15%)		9 (16.67%)	11 (22.22%)	
Distance from facial nerve trunk						
Accurate	11 (30.77%)	9 (23.08%)	0.00	9 (20.00%)	13 (30.00%)	0.71
Non-accurate	0 (0.00%)	17 (46.15%)		9 (20.00%)	13 (30.00%)	
Absence/rupture of capsule						
Accurate	11 (30.77%)	10 (26.92%)	0.01	14 (32.26%)	13 (29.03%)	0.50
Non-accurate	0 (0.00%)	16 (42.31%)		6 (12.90%)	11 (25.81%)	
Postoperative status of facial nerve						
Accurate	10 (19.23%)	10 (26.92%)	0.49	13 (24.32%)	11 (21.62%)	0.16
Non-accurate	4 (11.54%)	16 (42.31%)		9 (16.22%)	20 (37.84%)	

Synoptic reporting is a format of operative reporting that improves the quality and accuracy of the OpR, and has become popular in oncological surgery over the traditional narrative reporting style [13]. To date, there have been no published guidelines specifying the quantity and quality of clinical elements that should be included in an OpR of parotid gland surgery. This limits the applicability of the old nomenclature used in salivary gland surgery and promotes its conversion to the simpler terms proposed by the ESGS.

Thus, the purposes of this study are to: 1. define problems with previous inaccuracies; and 2. propose an informative and comprehensive OpR schema. The technical value will be verified based on the shortcomings of the preceding OpR in patients undergoing parotid tumor reoperation. The main outcome measure is to compare the impact of the accuracy of the first OpR on the reoperation course. Furthermore, the variables that factored into the non-accuracy of the OpR were analyzed.

MATERIAL AND METHOD

Material

Between 2008 and 2017, there were 1154 benign parotid tumor surgeries in a tertiary referral center, the Department of Otolaryngology and Laryngological Surgery, Poznan University of Medical Sciences, Poland. The study covered 71 consecutive patients reoperated due to benign parotid gland tumor recurrence (rPBT). Out of 71 reoperations, 36 (51%) primary surgeries had been performed in our department, while 35 patients (49%) had come from other hospitals. The recurrence rate in our department was 36/1154 (3.1%).

Methods

The data from OpR, medical records and histological reports were reviewed before each reoperation. The following variables: sex, age, date of first surgery and reoperation, primary operative department, amount/quality of missing data, procedure type and histology were considered. The criteria of OpR, operating field and reoperation course were defined. An accurate OpR was defined as including mandatory information such as patient data, surgical team, date of surgery, duration, and procedure type, in addition to all of the following seven key prognostic and anatomic elements: tumor size, location, contact with or distance from the facial nerve trunk or branches, presence or absence of satellite tumors, complete removal or ruptured capsule, removed parenchyma (part/whole of the superficial lobe/deep lobe), and facial nerve function after surgery. A non-accurate OpR was defined as omitting any of these seven elements.

An anticipated operation field was defined as a faithful reflection in the primary OpR of the preserved structures and proper extent and amount of salivary gland parenchyma. The presence of differences between the description and intraoperative reality classified the operation field as unanticipated.

The anticipated reoperation course is a procedure that does not meet any of the following three conditions: 1. difficulties related to unanticipated findings such as scars and adhesions in the operating field, excessive bleeding, unpreserved structures, inconsistent amount of extant parenchyma; 2. discrepancies from preoperative imaging examinations: size, deep lobe/parapharyngeal space infiltration, additional (not described in previous imaging studies) satellite tumors, suspected malignancy, nerve VII retracted into the tumor and other deviations from preoperative imaging examinations; and 3. facial nerve infiltration despite lack of clinical signs or radiological evidence.

An unanticipated operation course is defined as the occurrence of any one of the above conditions during surgery. The main outcome measure was to compare the impact of the accuracy of the first OpR on an unanticipated reoperation course.

This study was conducted in accordance with a protocol approved by the Bioethics Committee of the Karol Marcinkowski University

of Medical Sciences in Poznań (Resolution No. 1256/18), and written consent was obtained from each patient.

STATISTICAL ANALYSIS

All collected data was analyzed statistically using the STATISTICA 12.0 software (StatSoft, Inc.). The significance level was $\alpha = 0.05$. Statistical analysis was performed using the chi-squared (2) and chi-squared ($\chi 2$) test with the Fisher correction.

RESULTS

There were 1154 primary parotid surgeries performed in our department within the reviewed period. Out of these, 36 patients (3.12%) developed rPBT. The remaining 34 were from other hospitals. The average age of the patients at the time of the primary surgery was 44.66 years, and at reoperation, 51.78 years. The mean tumor recurrence time was 7.12 years. The sex distribution was 43 women (61%) and 28 men (39%). The operative protocols were assessed according to a common, uniform, validated scheme for otolaryngological operations. 36/71 (51%) of primary OpR were available in the OpR books, and 37/71 (52%) were collected from other medical records that included descriptions of procedures.

Accurate OpR

All primary OpR were described using the narrative form. All OpR included exact patient data and operating staff roster. Primary tumor data was missing in 78% (28/36), and the time of surgery was missing in 25% (9/36) of OpR. The date of the primary surgery was omitted in 3 cases. Other data that were missing in the original protocols were: tumor location in 5 (14%) cases, tumor size in 10 (28%) cases, facial nerve contact in 12 (33%) cases, presence of satellite tumors in 11 (31%) cases, capsule condition in 9 (25%) cases, extent and amount of removed parenchyma in 8 (22%) cases, and facial nerve function after surgery in 14 (39%) cases.

The most common type of primary surgery was partial superficial parotidectomy (PSP) (12/36) and these OpR lacked the following data: tumor location (2/12), tumor size (4/12), facial nerve contact (5/12), presence of satellite tumors (4/12), capsule condition (4/12), extent and amount of removed parenchyma (4/12), and facial nerve function after surgery (6/12). In other types of primary surgery, 39% (14/36) lacked information concerning facial nerve function after surgery. The accuracy of reoperation reports in our department was 62% (44/71).

Anticipated operation field

16% (11/71) of reoperations were classified as anticipated: 6 (55%) after primary PSP, 3 (27%) after extracapsular dissection, 1 (9%) after superficial parotidectomy (SP), and 1 (9%) after deep lobe parotidectomy. Reoperation procedures performed in anticipated reoperation fields are: PSP – 7 (64%), extracapsular dissection – 3 (27%), and total parotidectomy – 1 (9%), and concerned 73% (8/11) of Warthin's tumor recurrences. An anticipated reoperation field was observed in 79% (11/14) of accurate primary OpR.

Anticipated reoperation course

35% (25/71) of reoperation courses were classified as anticipated: 11 (44%) extracapsular dissections, 7 (28%) PSPs, 3 (12%) SP, and 2 (8%) deep lobe parotidectomies. The primary report was unavailable in 3 (12%) cases that were categorized as having anticipated reoperation courses. 37% (26/71) of reoperation courses in our department were anticipated. The correlation between variables is presented in Tab. I.

The impact of the accuracy of the primary OpR on the reoperation course was analyzed. An anticipated reoperation course followed 20% (5/26) of accurate and 20% (5/26) of non-accurate primary OpR. An unanticipated reoperation course followed 20% (9/45) of accurate and 40% (18/45) of non-accurate primary OpR. There is no statistically significant relationship between the reoperation course and the accuracy of the first OpR [Chi2(1) = 0.69; p = 0.40466]. Based on the results presented in Tab. I., in statistically significant correlations (<0.05), the largest percentage was associated with non-accurate OpR and unanticipated reoperation courses and fields.

DISCUSSION

A comprehensive, accurate, and honest OpR is crucial in the management of malignant head and neck tumors because of its implications for the treatment course. Several studies have analyzed the value of OpR of primary surgeries in significantly larger patient cohorts [4–6], but our research is the first to investigate the reoperation reports and impact on subsequent surgery.

We have focused on the validity of these OpR due to their ubiquity in everyday practice in a tertiary referral center. In institutions designated for salvage procedures, they are especially important. We did not find any examples in the literature of how the application of a uniform operative classification with detailed variables from the primary OpR facilitated the earlier detection of recurrence or impacted reoperation planning. Our analysis was carried out in 2017, before the new ESGS classification had been incorporated into OpR, but it can already be seen from our single institution analyses that because of scanty detail included in narrative primary reports, some information was not available for decision making and guidance during reoperation.

Recurrence depends on factors such as tumor size, presence of satellite tumors, incomplete tumor resection or capsular rupture [12, 14–16]. The decision to reoperate must take into consideration these factors, investigated by way of physical exam, ultrasonography, computed tomography and/or magnetic resonance imaging. Furthermore, data from the primary surgery should shed light on the probability of tumor seeding and allow for the identification of patients for whom follow-up should be frequent and regular [14, 17–18]. Comprehensive knowledge of each of these elements minimizes the risk of intra- and post-operative complications associated with reoperation. For example, tumor contact or distance from the trunk of the facial nerve and its branches is crucial information to be taken into careful consideration when planning reoperation: if the nerve was previously exposed and dissected, considerable time may be spent during reoperation on locating it amongst fibrous tissue and preserving it [14].

The time to recurrence depends on the tumor histological type and ranges from 2–15 years for pleomorphic adenoma (PA) [17, 18]. In our material, the mean tumor recurrence was 7.12 years. There is a general tendency towards immediate surgical resection, and this may be due to fear that any delay could increase the risk of recurrence and malignant transformation. On the contrary, this negative reputation may be somewhat overstated [4]. The risk of malignant transformation is low and this lends greater flexibility towards a more conservative management approach. Nodules of recurrent PA can be monitored easily, inexpensively and accurately by ultrasound examination, and suspicious nodules can be sampled using fine needle aspiration cytology. A young adult with PA recurrence is unlikely to avoid further surgical treatment, but an attempt can be made to delay disfiguring surgery by a decade or more through judicious surveillance with patient collaboration [14].

The difficulty in selecting the most suitable procedure for treatment of relapse is due to unanticipated findings in the operating field, miliary tumor spread, and scarring. For this reason, synoptic reporting should be used to increase the comprehensiveness and accuracy of the OpR [19, 20]. We advocate for more robust and systematic recording of intraoperative findings during primary and revision parotid surgery, in accordance with the ESGS guidelines [11] as well as our proposed model of operative reporting.

CONCLUSION

The primary surgery contains particularly pertinent information that can minimize the risk of complications during reoperation. The OpR is an important document that should include all criteria, providing clear information about all possible difficulties and complications, and is highly relevant for the future treatment of the patient.

We believe that this is where the advantage of a detailed OpR lies, and its comprehensiveness and accuracy can be increased through the use of the synoptic reporting style. The new nomenclature and our proposed model of operative reporting should be introduced to increase the percentage of accurate operative reports.

DEDICATION

This paper is dedicated to the memory of Tomasz Kopec, MD PhD.

REFERENCES

1. Rullier E., Denost Q., Vendrely V. et al.: Low rectal cancer: classification and standardization of surgery. Dis. Colon Rectum, 2013; 56: 560–567. doi: 10.1097/DCR.0b013e31827c4a8c.
2. Hoffmann J., Wallwiener D.: Classifying breast cancer surgery: a novel, complexity-based system for oncological, oncoplastic and reconstructive procedures, and proof of principle by analysis of 1225 operations in 1166 patients. BMC Cancer, 2009; 9: 108. doi: 10.1186/1471-2407-9-108.
3. Eng J.L., Baliski C.R., McGahan C. et al.: Completeness of breast cancer operative reports in a community care setting. Breast, 2017; 35: 91–97. doi: 10.1016/j.breast.2017.06.042.
4. Robertson R.L., Vergis A.: Synoptic Operative Reporting: Documentation of Quality of Care Data for Rectal Cancer Surgery. Am Surg, 2020; 86: 184–189.
5. Blencowe N.S., McNair A.G.K., Davis C.R. et al.: Standards of outcome reporting in surgical oncology: a case study in esophageal cancer. Ann Surg Oncol, 2012; 19: 4012–4018. doi: 10.1245/s10434-012-2497-x.
6. Hoffer D.N., Finelli A., Chow R. et al.: Structured electronic operative reporting: comparison with dictation in kidney cancer surgery. Int J Med Inform, 2012; 81: 182–191. doi: 10.1016/j.ijmedinf.2011.11.008.
7. Deal S.B., D'Angelica M.I., Hawkins W.G. et al.: Synoptic operative reporting for laparoscopic cholecystectomy and pancreaticoduodenectomy: A multi institutional pilot study evaluating completeness and surgeon perceptions. Am J Surg, 2018; 216: 935–940. doi: 10.1016/j.amjsurg.2018.06.008.
8. Ehrlich P.F., Hamilton T.E., Gow K. et al.: Surgical protocol violations in children with renal tumors provides an opportunity to improve pediatric cancer care: a report from the Children's Oncology Group. Pediatr Blood Cancer, 2016; 63: 1905–1910. doi: 10.1002/pbc.26083.
9. Chang S.-C., Hsu C.-P., Tsai C.-Y. et al.: Selective reoperation after primary resection as a feasible and safe treatment strategy for recurrent pancreatic cancer. Medicine (Baltimore), 2016; 95: e4191. doi: 10.1097/MD.0000000000004191.
10. Ortenzi M., Ghiselli R., Paolucci A. et al.: The feasibility of laparoscopic rectal resection in patients undergoing reoperation after transanal endoscopic microsurgery (TEM). Surg Endosc, 2018; 32: 2020–2025. doi: 10.1007/s00464-017-5898-x.
11. Quer M., Guntinas-Lichius O., Marchal F. et al.: Classification of parotidectomies: a proposal of the European Salivary Gland Society. Eur Arch Otorhinolaryngol, 2016; 273: 3307–3312. doi: 10.1007/s00405-016-3916-6.
12. Wong W.K., Shetty S.: Classification of parotidectomy: a proposed modification to the European Salivary Gland Society classification system. Eur Arch Otorhinolaryngol, 2017; 274: 3175–3181. doi: 10.1007/s00405-017-4581-0.
13. Stogryn S.E., Hardy K., Mullan M.J. et al.: Synoptic operative reporting: assessing the completeness, accuracy, reliability, and efficiency of synoptic reporting for Roux-en-Y gastric bypass. Surg Endosc, 2018; 32: 1729–1739. doi: 10.1007/s00464-017-5855-8.
14. Valstar M.H., Andreasen S., Bhairosing P.A. et al.: Natural history of recurrent pleomorphic adenoma: implications on management. Head Neck, 2020, doi: 10.1002/hed.26137.
15. Aro K., Valle J., Tarkkanen J. et al.: Repeatedly recurring pleomorphic adenoma: a therapeutic challenge. Acta Otorhinolaryngol Ital, 2019; 39: 156–161. doi: 10.14639/0392-100X-2307.
16. Ha E.F., Mj B., Wa Z.: Comparison of the Effect of Total Conservative Parotidectomy Versus Superficial Parotidectomy in Management of Benign Parotid Gland Tumor: A Systematic Review Available online: https://pubmed.ncbi.nlm.nih.gov/25769678/ (accessed on May 20, 2020).
17. Park S.Y., Han K.-T., Kim M.-C. et al.: Recurrent Pleomorphic Adenoma of the Parotid Gland. Arch Craniofac Surg, 2016; 17: 90–92. doi: 10.7181/acfs.2016.17.2.90.
18. Redaelli de Zinis L.O., Piccioni M., Antonelli A.R. et al.: Management and prognostic factors of recurrent pleomorphic adenoma of the parotid gland: personal experience and review of the literature. Eur Arch Otorhinolaryngol, 2008; 265: 447–452. doi:10.1007/s00405-007-0502-y.
19. Eng J.L., Baliski C.R., McGahan C. et al.: Uptake and impact of synoptic reporting in a community care setting. Am J Surg, 2018; 215: 857–861. doi: 10.1016/j.amjsurg.2018.01.007.
20. Gur I., Gur D., Recabaren J.A.: The computerized synoptic operative report: a novel tool in surgical residency education. Arch Surg, 2012; 147: 71–74. doi: 10.1001/archsurg.2011.228.

Word count: 2828 Tables: 1 Figures: – References: 20

DOI: 10.5604/01.3001.0014.6240 Table of content: https://otolaryngologypl.com/issue/13767

Competing interests: The authors declare that they have no competing interests.

Corresponding author: Krzysztof Piwowarczyk MD; Department of Otolaryngology and Laryngological Oncology, Poznan University of Medical Sciences, Poznan; Przybyszewskiego street 49, 60-355 Poznan, Poland; Phone: +48 618691387;
E-mail: krzysztofpiwowarczyk2@gmail.com

Cite this article as: Piwowarczyk K., Ewelina Bartkowiak E., Chou J.T., Kukawska K., Piwowarczyk L., Wierzbicka M.: The impact of accuracy of documentation of parotid tumor operative reports on secondary surgical intervention; Otolaryngol Pol, 2021: 75 (3): 1-7