

The Value of Elective Parotidectomy in Advanced Squamous Cell Carcinoma of the Skin of the Head

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Abstract. *Background: Parotid metastases from cutaneous squamous cell carcinoma (CSCC) are associated with poor prognosis. However, the incidence of occult parotid lymph node metastases in high-risk CSCC is unclear. Therefore, the role of elective parotidectomy is still controversial. The purpose of the present study was to analyze the value of elective parotidectomy in patients with high-risk CSCC. Patients and Methods: The clinical data including histological and radiological results, as well as surgery-related complications, of 13 patients with high-risk CSCC who underwent elective parotidectomy were retrospectively analyzed. Results: Occult parotid lymph node metastases were detected by histological examination in only 1 out of 13 patients after elective parotidectomy. Surgery-related complications and morbidity were not observed. Conclusion: In the absence of clinical disease in the parotid gland, the risk of occult metastases is not high enough to warrant for elective parotidectomy in patients with CSCC.*

Non-melanoma skin cancer is the most common malignancy affecting humans worldwide. Besides basal cell carcinoma, cutaneous squamous cell carcinoma (CSCC) is the most common form of non-melanoma skin cancer. In accordance with the pathogenesis, 70-90% of CSCCs are located in the head and neck region (1, 2). Most CSCCs are characterized by good prognosis, with a 3-year overall survival rate of 85-100% and can be easily treated in most cases (3). However, a small group of patients who have a specific risk profile suffer from lymph node metastases. The prognosis of those patients decreases significantly, with a 5-year survival rate of approximately 25-50% (4).

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Key Words: Parotid metastases, high-risk skin cancer, elective parotidectomy, occult lymph node metastases, squamous cell carcinoma.

Since the lymphatics from the skin of the forehead, temple, eyelid, cheek, and external ear drain into the lymph nodes of the parotid gland, CSCCs of the mentioned skin areas may lead to parotid metastases. In previous studies, the incidence of parotid metastases was estimated to be 5% for patients with CSCC of the scalp and about 10% for patients with CSCC of the external ear (5). However, the incidence of occult parotid metastases in cases of high-risk CSCC of these skin areas is still unknown. Since the extent of parotid and neck node involvement has an impact on the survival of patients with CSCC (1, 4), great clinical relevance is attributed to early diagnosis and therapy of such metastases (6, 7). Currently it is unclear whether elective parotidectomy is a promising procedure for patients with high-risk CSCC without clinical suspicion of metastases. The aim of the present study was to determine whether performing elective parotidectomy in these patients is a reasonable procedure.

Materials and Methods

We performed a retrospective chart review of patients with CSCC of the skin of the head who underwent elective parotidectomy between January 1998 and December 2012. Elective parotidectomy was performed in patients with locally advanced CSCC larger than 1.5 cm in diameter and with evidence of at least one further risk factor for the development of parotid metastases. Further risk factors included an age of over 70 years, tumor infiltration of more than 4 mm, as well as immunosuppression. All CSCCs were located in the skin of the head without clinical evidence of parotid lymph node involvement (Table I). Patients with CSCC infiltrating the parotid gland or localized outside the mentioned skin area, as well as CSCC smaller than 1.5 cm in diameter, were excluded from the study.

Thirteen patients fulfilled the inclusion criteria, 11 (85%) of whom were male. The mean age at diagnosis was 77.6 years (range=67 - 91 years), with an average follow-up time of 2.8 years (range=1 - 7 years). The mean diameter of the primary tumor was 3.4 cm and the mean depth of tumor infiltration was 10 mm. Two of the examined patients suffered from chronic renal failure and one patient from malignant non-Hodgkin's lymphoma. Another patient underwent renal transplantation. Clinical relevant characteristics of all patients are summarized in Table I. The clinical and histological data were evaluated by descriptive analysis.

The staging of parotid and neck node involvement included ultrasound examination and magnetic resonance imaging (MRI) of

the parotid gland and neck, as well as computed tomography (CT) of the chest in all cases. All patients underwent primary skin cancer resection with clear margins (R0), as well as an ipsilateral superficial lateral parotidectomy and selective neck dissection of level I-III and Va. Except for one patient, all patients suffering from lymph node metastases received adjuvant radio-(chemo)therapy. Patients with distant metastases underwent palliative chemotherapy.

It should be mentioned that four patients initially had cytologically positive neck lymph nodes of level II. These patients also underwent parotidectomy in combination with neck dissection and skin cancer resection. They had the aforementioned high-risk profile and had no clinical or radiological signs of parotid disease (Table I).

Surgery-related complications were evaluated through access to surgery reports and anaesthesia protocols in the context of postoperative in-patient course. It was determined whose anatomical structures had been preserved or resected. It was investigated whether there was any injury of the facial nerve or whether there had been any significant bleeding. For postoperative complications, abnormal wound healing, seroma, Frey's syndrome, secondary haemorrhage, and neural function were analyzed by clinical examination. Preoperatively, normal function of the facial nerve was documented for all patients.

Results

Parotid lymph node involvement was found by histological evaluation in only one out of 13 (7.7%) patients. The parotid lymph node metastasis was 7 mm in diameter, without perinodal spread, and occurred in a 91-year-old patient with a retroauricular CSCC of 7.0 cm in diameter with infiltration of the sternocleidomastoid muscle. This lymph node had initially shown no signs of malignant changes on preoperative examination.

Locoregional recurrence occurred in four (30.8%) patients in the follow-up time (patients no. 4, 6, 7 and 9). Three of these patients suffered from a recurrence at the primary site and another patient developed regional recurrence in the neck. Pulmonary metastases occurred in two patients in the follow-up time (no. 9 and 10). Each patient with locoregional recurrence or pulmonary metastases suffered from immune deficiency due to a malignant non-Hodgkin's lymphoma or medical treatment in the case of renal transplantation (no. 6, 10). Five (30.7%) patients died in the follow-up period, with a median survival time of 2.3 years. Two of these patients died because of distant failure.

Intraoperative surgery- or anaesthesia-related complications were not observed. No patient suffered from intraoperative injury of the facial nerve or significant bleeding. Postoperatively, no transient or persistent facial nerve paresis was observed in the present study. No secondary haemorrhage, seroma or Frey's syndrome associated with the parotidectomy was observed in the postoperative course. Neither in the immediate postoperative stage, nor over a longer period of time, was any disturbance of wound healing detected in the area of the parotidectomy and neck dissection.

Discussion

Lymph nodes of the parotid gland may be the main site of metastatic disease. These lymph nodes receive most of the lymphatic drainage from the ipsilateral facial skin and anterior scalp. They present a potential site for metastases in patients with CSCC, with a metastatic rate up to 10% (4, 8). About 40% of the metastases to the parotid gland are secondary to CSCC (9). This metastatic rate is especially true for immunocompetent patients with previously untreated tumors that are generally smaller than 1.5 cm in diameter at the time of first diagnosis. This relatively low incidence for regional metastases is opposed to the clearly higher metastatic incidence of so-called high-risk cancer.

The parotid metastases are in close neighbourhood to the cervical lymph nodes and are often associated with cervical lymph node metastases, similar to primary high-grade cancer of the parotid gland. Cervical metastases can be expected in more than 50% of the cases with parotid metastasis (10).

For defining patients at high risk for the development of regional metastases, several risk factors have been discussed in the literature. Primary lesion-specific risk factors include a tumor size of more than 1.5 cm, an infiltration depth of more than 4 mm, and low differentiation in tumor grading, as well as perineural tumor invasion. Patient-specific risk factors are an age of more than 70 years at diagnosis and immunosuppression (11-13). In the present study, half of the patients with metastatic disease suffered from chronic renal failure or were medically immunosuppressed because of renal transplantation. The impact of isolated risk factors or a combination of different risk factors on prognosis is still unknown.

The local tumor control rate, as well as the survival rate, of patients with parotid metastases from CSCC depends mainly on the size of the parotid metastases, and the infiltration of the facial nerve, and the skull base (6). Furthermore, the extent of cervical metastatic spread in the presence of parotid metastases has a high prognostic relevance. O'Brien *et al.* showed that patients with parotid metastases without cervical metastases, or with an isolated cervical metastasis of up to 3 cm have a 5-year survival rate of 65-70% while the 5-year survival of patients with multiple cervical metastases or metastases of more than 3 cm amounts to 30% (7). This and other studies confirm that the extent of parotid and cervical metastatic spread significantly influences the survival rate of the affected patients (14).

With this background, besides surgical treatment of CSCC, an early diagnosis and treatment of regional metastases is of significant importance. Similarly to benign tumors of the parotid gland, diagnosis of parotid metastases usually occurs when they reach a diameter of 2-3 cm. In particular, the early detection of occult lymph node metastases is thus clinically relevant.

Table I. Clinical data of 13 patients undergoing elective superficial parotidectomy for high-risk cutaneous squamous cell carcinoma.

Patient no.	Gender	Age (years)	Localization	Size (cm)	Infiltration depth (mm)	Grading	Parotid metastases	Neck metastases	Immunosuppression	Recurrence
1	M	75	Nose	3.5	10	2	-	-	-	-
2	F	76	Cheek	4.0	6	3	-	+	-	-
3	M	91	Retroauricular	7.0	15	3	+	-	-	-
4	M	67	Auricle	4.0	7	2	-	-	-	Local
5	M	83	Auricle	1.5	4	3	-	-	Renal failure	-
6	M	80	Auricle	3.5	4	2	-	-	Lymphoma	Local
7	M	82	Auricle	1.5	4	3	-	-	-	Local
8	M	70	EAC	2.5	12	2	-	-	-	-
9	M	85	Cheek	2.5	5	2	-	+	Renal failure	Neck/lung
10	M	66	Temple	4.5	18	2	-	+	NTX	Lung
11	M	67	Cheek	3.2	11	2	-	-	-	-
12	F	90	Retroauricular	3.0	15	2	-	-	-	-
13	M	76	Retroauricular	3.0	9	2	-	+	-	-

EAC: External auditory canal, NTX: renal transplantation.

The problem of the clinical N0 parotid and neck results from the partly insufficient sensitivity and specificity of non-invasive examination techniques. In head and neck cancer, if radiological examinations do not show any evidence of the presence of lymphatic spread, occult metastases must nonetheless be expected in approximately 25% of cases, depending on the location of the primary tumor (15). As yet, the incidence of occult parotid lymph node metastases has not been well-established and it is unclear whether performing elective parotidectomy and neck dissection is necessary in high-risk patients with N0 disease. There are only few studies in the literature about the incidence of occult parotid lymph node metastases. Yoon *et al.* reviewed 40 patients with CSCC of the auricle (16). In that series 8 out of 40 (20%) patients developed regional disease after excision of the primary tumor, which was localized in four cases (10%) in the parotid gland and in three cases (7.5%) in the neck. Therefore, the authors recommended elective parotidectomy with neck dissection with or without postoperative radiotherapy, especially in patients with poor prognostic features, such as cartilage invasion, extra-capsular growth, and depth of invasion, without setting any cut-off, and high histological grade. A former retrospective analysis of 11 patients with CSCC and eight patients with basal cell carcinoma of the auricle who underwent elective parotidectomy revealed no histological evidence of occult parotid metastases in all cases (17). The authors suggested that the risk of occult parotid metastasis from auricular carcinomas is low and that elective parotidectomy should not be considered mandatory in the surgical management of advanced auricular carcinomas. The low incidence of parotid involvement found in former studies is reflected in the results of the present study.

Currently, the most secure diagnostic procedure for detection of lymph node metastases is a histological examination by performing elective lymph node dissection. However, the increased sensitivity of such an approach may be associated with the potential risk of complications and an increased postoperative morbidity for patients, especially after elective parotidectomy. Although in the present study none of the patients suffered from facial nerve paralysis, in the literature, temporary facial nerve paralysis was documented in up to 42% and permanent paralysis in up to 3% of the patients after parotidectomy (18, 19).

In summary, elective parotidectomy, considering the potential risk of complications and morbidity and low rate of occult metastases, does not seem to be justified even in the case of high-risk CSCC. Frequent follow-up examinations, including sonography of the parotid gland and neck, should be performed, especially within the first 2 years after diagnosis in patients with risk factors in order to identify metastases at an early stage of disease (20).

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Received March 3, 2014
Revised March 17, 2014
Accepted March 18, 2014