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Complications and outcome after free flap surgery for cancer of the head and neck

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Abstract

We retrospectively studied 136 patients who had free flap reconstruction for cancer of the head and neck at a single centre (2008–2015) to evaluate complications, assess factors associated with them, and analyse their impact on outcome. Preoperative and perioperative data, and surgical and medical complications were recorded, and the impact of the complications on duration of hospital stay and survival were assessed. A total of 86 (63%) patients had complications. Compared with those who did not, they had a higher rate of alcohol abuse (21/86, compared with 5/50, $p = 0.039$), longer operations (median (IQR) 565 (458–653 compared with 479 (418–556) minutes, $p < 0.001$), and greater intraoperative loss of blood (725 (400–1150) compared with 525 (300–800) ml, $p = 0.042$). Complications were more common in patients who had fibular flaps and T4 disease (22/86 compared with 4/50, $p = 0.010$; 47/80 compared with 16/47, $p = 0.015$, respectively). Those who had complications also stayed in hospital longer (median (IQR) 9 (7–12) compared with 15 (10–21) days, $p < 0.001$). Cumulative mortality was higher in patients with late complications (those that occurred after the fourth postoperative day) (61% compared with 36%, $p = 0.004$). In conclusion, complications in more than half the patients were related to alcohol abuse, a more complicated intraoperative course, and fibular flaps. Complications were associated with a longer hospital stay, and survival was higher in those who did not have late complications than in those who did.

Keywords: free flap surgery; postoperative complications; outcome; cancer of the head and neck

Introduction

Complications are common after free flap repair of the head and neck, and the reported rate ranges from 34% to 85%.[1–5] Several variables are associated with an increased risk in this group, and they include smoking, advanced age, ASA class (American Society of Anesthesiologists), and excessive fluid.[2,6,7] However, complications are rarely described

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in detail, and different classifications are used, which makes comparison difficult. Complications have an impact on recovery, duration of hospital stay, oncological treatment, and outcome, but this remains unclear,[1,5,8–10] and as the rate in this group is relatively high, the selection of patients, prognosis, and true cost of microvascular surgery, continues to be discussed.[1,7]

We therefore aimed to evaluate the onset and distribution of complications and their impact on postoperative recovery and outcome in patients who had free flap reconstruction for cancer of the head and neck. We specifically aimed to evaluate related preoperative and perioperative factors and their impact on duration of hospital stay and survival.

Patients and methods

Setting

This retrospective registry study was conducted at Oulu University Hospital, which provides tertiary care for 750 000 inhabitants in Northern Finland. All data had been collected for clinical or administrative purposes. The study was approved by the hospital's administrators and by the local ethics committee (Regional Ethics Committee of the Northern Ostrobothnia Hospital, 95/2016).

Patients and inclusion criteria

We reviewed the records of all patients who had free flap repair for cancer of the head and neck between 2008 and 2015 at the head and neck surgery unit, Oulu University Hospital. During this period a total of 156 patients had reconstruction with a free flap. Of these, three had non-malignant tumours, 12 had reoperations because the flaps had failed, two had operations for traumatic injuries, and three had inadequate data. A total of 136 patients were therefore included.

Data extraction

We obtained patients' details (including intraoperative variables) from their medical records, anaesthesia charts, laboratory results, radiological statements, and the ICU (intensive care unit) database (Centricity^{TM} Critical Care Clinisoft, GE Healthcare). The duration of hospital stay was calculated as the time from the day of operation until discharge. Data were collected on structured forms and then digitised. The Population Register Centre of Finland provided dates of death. Survival was followed until 30 April 2017.

Complications

Data on postoperative complications were obtained from the medical records. The analysis included all surgical and medical complications during the hospital stay, and those up to 30 days after discharge.

Surgical complications included infection or haematoma at the surgical site, the need for reoperation, and partial or total failure of the flap. Medical complications included pneumonia, myocardial infarction, sepsis, acute kidney injury, stroke, pulmonary embolism, deep venous thrombosis, and pulmonary oedema. Complications were categorised as early (onset between one and four days postoperatively) or late (onset more than four days postoperatively), and onset was calculated to an accuracy of one day.

Statistical analysis

Data were analysed using IBM SPSS Statistics for Windows, version 22 (IBM Corp). Categorical variables, presented as absolute numbers and percentages, were compared using Pearson's chi squared test. Continuous variables, presented as median (IQR), were analysed using the non-parametric Mann–Whitney test. Kaplan–Meier survival curves were drawn to analyse long-term survival, and the Log-Rank test used for comparison between groups. Probabilities of less than 0.05 were considered significant.

Results

A median (range) of 16 (8–29) operations were done annually at our centre from 2008 to 2015. The median (IQR) age of the study population was 65 (59–74) years, and 75 (55%) were men. Most patients were ASA class III–IV (n = 73, 54%) and 133 (98%) were treated postoperatively in the ICU (Table 1). Patients were followed up for a median (IQR) of 26 (14–51) months.

Complications

A total of 86 (63%) patients had at least one complication. These were medical in 51 (38%) and surgical in 64 (47%). In 29 (21%) they were both medical and surgical.

The most common medical complication was pneumonia (n = 36) and the most common surgical complication was infection at the surgical site (n = 36) (Table 2). Compared with patients who did not have complications, those who did had a higher rate of alcohol abuse (21/86 compared with 5/50, p = 0.039), longer operating times (median (IQR) 565 (458–653) compared with 479 (418–556) minutes, p = 0.001) and greater intraoperative blood loss (median (IQR) 725 (400–1150) compared with 525 (300–800) ml, p = 0.042). They also had more fibular free flaps (22/86 compared with 4/50, p = 0.010) and T4 tumours (47/80 compared with 16/47, p = 0.015). There was no difference in the preoperative risk classification according to the ASA grade or coexisting conditions (Table 1).

Fibular free flaps were more common in patients with T4 tumours (24/26 compared with 40/101, p < 0.001).

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