

Postoperative complications after major head and neck surgery with free flap repair—prevalence, patterns, and determinants: a prospective cohort study

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Abstract

This study aims to give a better understanding of the prevalence, patterns, and determinants of postoperative complications, to evaluate the Clavien–Dindo classification of surgical complications, and to set out a protocol to improve postoperative recovery. Over a period of 27 months we studied 192 patients who had had major head and neck operations with free flaps. Data on complications were gathered prospectively along with patients' details, comorbidities, factors indicative of the magnitude of the surgical insult, and variations in perioperative care. Complications were classified according to the Clavien–Dindo system. Outcomes analysed comprised any complication, major complications (Clavien–Dindo III and above), wound complications, and pulmonary complications. A total of 64% of patients had complications, and in around one third they were serious; wound and pulmonary complications were the most common. Factors significantly associated with complications reflected an interaction between coexisting conditions of the patient at operation and the magnitude of the surgery. Perioperative interventions to ensure preoperative optimisation of patients, and to lessen the systemic inflammatory response that results from operation offer the best prospect of reducing the burden of surgical complications. A protocol to improve recovery after operation would be appropriate. The Clavien–Dindo classification of surgical complications is useful in this group.

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Keywords: Head and neck surgery; Surgical complications; Free flap; Microsurgery; Clavien–Dindo classification

Introduction

Postoperative complications have their genesis in the interaction between 3 categories of variables. The first is acute

and chronic coexisting conditions that are present at the time of operation¹ and the second is the magnitude of the surgical insult. Major head and neck operations with microvascular reconstruction are prolonged procedures that involve at least 2 distinct surgical sites, and the physiological insult is considerable. The third category concerns perioperative care by a multidisciplinary team, which unless highly coordinated, may be subject to considerable variation.

Considering all the above it is not surprising that there is a high incidence of postoperative complications in patients undergoing major head and neck operations with free flaps.

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Table 1
Clavien–Dindo classification of surgical complications.²

Grade	Definition
I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, or radiological interventions Permitted therapeutic regimens are: drugs as antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy. The grade also includes wound infections opened at the bedside
II	Requiring pharmacological treatment with drugs other than those permitted for grade I complications Blood transfusions and total parental nutrition are also included
III	Requiring surgical, endoscopic, or radiological intervention
IIIa	Intervention not under general anaesthesia
IIIb	Intervention under general anaesthesia
IV	Life-threatening complication (including complications of the central nervous system) ^a that requires management in a high dependency, or intensive therapy unit
IVa	Single organ dysfunction (including dialysis)
IVb	Multiorgan dysfunction
V	Death

Suffix “d” If the patient suffers from a complication at the time of discharge the suffix “d” (for “disability”) is added to the respective grade of complication. It indicates the need for follow-up to fully evaluate the complication

^a Brain haemorrhage, ischaemic stroke, subarachnoid bleeding, but excluding transient ischaemic attacks.

We have noticed that few patients follow an ideal postoperative course, and although many of the complications are minor, serious ones occur regularly and add considerably to the patient’s suffering and to the cost to the health service.

This study had several goals. First, we wished to better understand the prevalence, patterns, and determinants of postoperative complications. Secondly, it was apparent that there is a need to classify complications according to severity and we wished to evaluate the Clavien–Dindo classification system in these patients.² Finally, we hope that the data presented will help in the development of a protocol to improve postoperative recovery specifically for these patients.

Method

Over a 27-month period from August 2009 to November 2011 a total of 192 consecutive patients had head and neck operations with free flaps at the Southern General Hospital in Glasgow. During the period any inpatient complication was prospectively recorded on a database. Complications identified in the outpatient clinic or from correspondence after discharge were also recorded. Case notes were reviewed after discharge to ensure that data were as complete as possible.

Data on patients’ coexisting conditions were obtained from the case notes. Details from the past medical history allowed a score to be allocated using the Adult Comorbidity Evaluation-27 index (ACE-27).¹ The American Society of Anesthesiologists’ (ASA) grade was obtained from the anaesthetic records. The patient’s performance status was graded according to World Health Organization (WHO) or Eastern Cooperative Oncology Group (ECOG) criteria³ as

part of the dataset for the multidisciplinary team meeting for all patients having operations for cancer. Data on nutritional status were recorded on admission using the Malnutrition Universal Screening Tool (MUST),⁴ which uses the body mass index, estimation of the effect of acute disease on nutrition, and weight loss, to generate a score (0 indicates low risk, 1 medium risk, and 2 or more high risk of malnutrition). Any patient with acute disease effect had a score of 2. Patients with weight loss estimated at 5–10% of their bodyweight had a score of 1, and those estimated to lose more than 10% had a score of 2. Age and previous radiotherapy to the head and neck were included in the analysis. Qualitative factors, which might have influenced chronic physiological status at the time of operation, were also recorded. They comprised sex, current tobacco smoking and use of alcohol, pulmonary disease, occlusive vascular disease, and diabetes mellitus. We analysed quantitative data that reflect acute physiology at the time of operation, including immediate (within 14 days) preoperative estimation of C-reactive protein (CRP) and serum albumin concentrations.⁵

Data indicative of the magnitude of the surgery comprised duration of operation, use of flaps that contained bone as well as soft tissue, and the need for perioperative blood transfusion.

All patients were managed in the same institution using a common operating theatre suite, critical care facility, and surgical ward. Two factors differed according to the preference of the operating team. One team used a prolonged course of prophylactic antimicrobials (amoxicillin-clavulanic acid 1.2 g 8 hourly given intravenously for 5 days) and perioperative glucocorticoids (16 mg at induction, 8 mg 8 hourly for 3 doses, then 4 mg 8 h later). The other team used 24 h of prophylactic antimicrobials (1.2 g amoxicillin-clavulanic acid started at induction and repeated 8 hourly for 4 further doses).

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