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Challenges in global microsurgery: A six year review of outcomes at an East African hospital[☆]



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Summary *Background:* Free tissue transfer is an invaluable resource for reconstruction of complex defects. There is very little evidence as to the feasibility and outcomes of microsurgery performed in East Africa. This study will analyse outcomes of 114 consecutive free flaps, performed over 6 years at a single plastic surgery unit in Uganda. It aims to demonstrate that despite its challenges, successful microsurgical practice can be set up in East Africa.

Methods and patients: The notes of 100 consecutive patients who underwent 114 free flaps between 01/06/2009 and 01/07/2015 at CoRSU Hospital, Uganda were analysed.

Results: One hundred and fourteen free flaps were performed on 100 patients. The types of free flaps used included free fibula (n = 41), ALT (n = 30), gracilis (n = 8), radial forearm (n = 7), latissimus dorsi (n = 9) and rectus (n = 7) amongst others (n = 12).

The most common indications for surgery were head and neck cancer (n = 50), trauma (n = 19), osteomyelitis (n = 18), burns (n = 13), head and neck infection (n = 6). Over the six year period there was an overall 76% survival of the flaps. However in the last two years of the series there was a flap survival rate of over 93% (n = 50). There were 40 non-microsurgical complications including wound infection (n = 10) and graft loss (n = 8).

Conclusion: This is one of the first studies to report on the outcomes of free flaps performed at an East African centre. There is a steep but surmountable learning curve to improve microsurgery delivery in East Africa. This study identifies challenges in patient demographics, surgical experience and resources that have been overcome to improve outcomes.

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Introduction

Free flaps are an invaluable part of the plastic surgical tool kit, with potential of success rates of over 95%.¹ There are few published outcomes on free tissue transfer performed in the developing world. Giessler et al.^{2,3} describe performing free flap reconstructions of Noma deformities in Nigeria during surgical missions. However, there are no published reports on outcomes of free flap surgery performed outside of surgical missions, by a locally led plastic surgery team in an East or West African hospital.

There are few plastic surgery centres in the developing world which perform microsurgery. The challenges these units face in delivering sustainable microsurgical practice are under-reported. There is a growing worldwide interest in global surgery and the delivery of sustainable locally led surgical services in low and middle income countries.⁴ By investigating and publishing the challenges faced by existing units, experiences can be built upon when trying to establish and improve microsurgical centres in the developing world.

This article is an evaluation of surgical outcomes of 114 consecutive cases of free tissue transfer over 6 years at a single plastic surgery unit in Uganda. It raises the challenges faced in delivering sustainable, locally led free flap practice in the developing world. Comprehensive Rehabilitation Services Uganda (CORSU) is a private 60 bed, not for profit specialist centre near Kampala, Uganda. It treats elective plastic and orthopaedic patients, the majority of which are in the paediatric age range. It is funded through charity donations as well as modest patient fees. The plastic surgery department has two consultant plastics surgeons, one of whom was trained in the UK and has been in Uganda 16 years and the other largely trained in Uganda. They currently have three registrars in training on MMed Plastic & reconstructive surgery course.

Methods

The physical notes and computerised database records of 100 patients who underwent 114 free tissue transfers between 01/06/2009 and 01/07/2015 at Comprehensive Rehabilitation Services Uganda (CoRSU) were analysed. Records prior to 01/10/2013 were analysed retrospectively whilst those from 01/10/2013 to 01/07/2015 were collected and analysed prospectively. An interim audit of free flap outcomes from 01/06/2009 to 01/10/2013 was performed at CoRSU and strategies to improve outcomes were discussed and implemented.

The flaps were raised using surgical loupes. The flaps were flushed using a heparinised saline solution and a single intraoperative dose of intravenous heparin administered. All anastomoses were performed using microsurgical sutures and a Zeiss™ OPMI VARIO S88 surgical microscope. Routine flap monitoring was performed by nursing staff with doctor review. In most cases where an immediate reconstruction was performed, resection and reconstruction was performed by the same surgical team.

Results

Demographics

One hundred (n = 100) patients underwent 114 free tissue transfers (twelve patients underwent two free flaps and one patient underwent three) between 01/06/2009 and 01/07/2015. There was a trend for increasing number of cases per year [Figure 1]. Fifty nine flaps were performed in females and 55 in males. Patient age ranged from 3 years to 61 years (med = 22 yrs, IQR-13–32 yrs) including 52 paediatric cases. Co-morbidities included sickle cell disease (n = 2), diabetes (N = 1) and albinism (n = 2). No routine HIV testing was performed.

Operative details

The majority of flaps (n = 50) were performed for head and neck cancer, but other common indications included head and neck infections, burns, osteomyelitis and trauma [Figure 2].

The choice of flap for the flap utilised for the reconstructions was diverse with 16 different flap types applied to equally variable recipient sites (n = 23) [Figure 3]. The most common recipient sites were the mandible and lower leg. The most used types of flap were fibula (n = 41) and ALT (n = 30).

Forty one percent (n = 47) of cases were immediate free flap reconstruction whereas 59% (n = 67) of free flaps were inset onto chronic defects.

In total twenty one of the 114 cases needed an intra-operative revision of either the venous or arterial anastomosis due to poor flap perfusion or drainage. In three cases the vessel was thrombosed at the anastomosis. In the period prior to October 2013 17% of cases had in intra-operative takedown and repeat of anastomosis compared with 22% in the period 01/10/2013–01/07/2015. Flaps which required intra-operative revision of the anastomosis had only a 62% success rate.

Ischaemic and operative times for each procedure were recorded [Figure 4]. Free fibula flaps had the longest median ischaemic time of 150 mins (IQR = 120–170 mins). The median ischaemic times for Anterolateral Thigh (ALT), Gracillis, Radial Forearm and Rectus abdominis free flaps were comparable (Gracillis = Med:101 mins IQR 81–121 mins; ALT = med106 mins IQR: 90–121 mins; radial

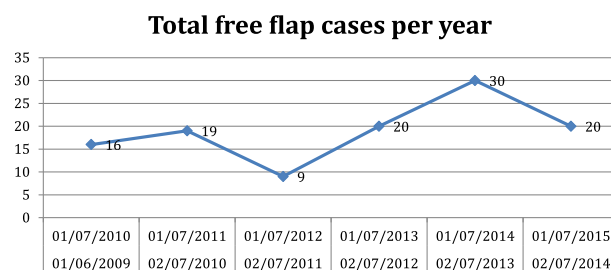


Figure 1 Number of free flaps performed per year at CoRSU.

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