

## ORIGINAL RESEARCH

### **Free Flap in Head and Neck Cancers! – Experience from Low Resource Settings in Central India**

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#### **ABSTRACT**

**Background:** Head neck reconstruction surgery has considerably evolved over the past decade along with trend in using the free flap.

**Materials and Methods:** This is a retrospective study was conducted in 2020-21 from central India, Jabalpur Madhya Pradesh. We have collected the data from electronic records of 56 consecutive patients.

**Results:** Our study showed that with necessary basic prerequisite, free flap surgery can be performed safely with good outcome even in resource limited settings.

**Conclusion:**

Our study showed that with necessary basic prerequisite, free flap surgery can be performed safely with good outcomes even in resource limited settings. Starting free flap surgery is need of modern medicine to achieve better functional, cosmetic outcome and get advantage of pliability of free flap with less morbidity.

**Keywords:** Free Flap, Head neck cancer, Reconstructive surgery.

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#### **INTRODUCTION**

Head neck reconstruction surgery has considerably evolved over the past decade along with trend in using the free flap. First pedicle was described by Susruta in 800 BC and consisted of forehead flap and it was popularized by McGregor in 1963.<sup>[1,2]</sup> A decade later pectoralis major myocutaneous flap was introduced by Ariyan in 1979 and became the flap of choice for head neck reconstruction.<sup>[3]</sup> With the advent of microvascular surgery in 1970 harvesting free flap become popular in the head neck surgery.<sup>[4]</sup> Free flap surgery is complex surgery require expertise of microvascular surgery and longer operative time with higher cost, but they show more versatility and robustness than pedicle flap for some defects.<sup>[5]</sup> This study was about, how to achieve a good outcomes in head neck free flap onco-plastic surgeries in resource limited settings.

#### **MATERIALS & METHODS**

This is a retrospective study was conducted in 2020-21 from the central India, Jabalpur Madhya Pradesh. We have collected the data from electronic records of 56 consecutive

patients. The data of demographic profile, methods of reconstruction, technical aspects, blood loss, duration of surgery and immediate postoperative results were collected.

## RESULTS

Median age of our cohort was 43 years (21- 71 years). Male and female ratio was 4.6 (male-46. Female- 10). Mean duration of surgery was 7 hours 20 minutes (5 to 11 hours). Mean blood loss was 300 ml (100 to 1200 ml). Most common sub- site was buccal mucosa 24 (42%) followed by alveolus 16 (28%), retro molar trigone 8 (14.2%), lip 4 (7%), tongue 2 (3%) and palate 2 patients (3%). Commonest mode of addiction was area nut (90%) and tobacco (87%) in chewing form followed by smoking (56%) and alcohol (38%). Free Anterolateral thigh flap (ALT) was done in 40 patients (71%) followed by medial sural artery flap (MSAP) in 6 patients (10%), free radial forearm flap in 5 patients (8 %) and vascularized free fibula flap (FFF) in 5 patients (8%). Flap necrosis was seen in 3 patients (5%) one in free fibula, one in ALT and one in MSAP flap necrosis was found. Local myo-cutaneous flap was performed after flap necrosis. Partial flap necrosis was seen in one patient (1.7%) of ALT flap due to large size flap of 30 x 18 cm that was managed by debridement and suturing of flap. Flap dehiscence was seen in 3 patients (5%). In all three patients dehiscence was seen at commissure. Split skin grafting (SSG) was done in 35 patients (62%) to cover donor area defect. Three patients were explored under local anesthesia postoperatively. Thrombosis was found in one patient in anastomotic artery and another patient in anastomotic vein that was reanastomosed after clot extraction. One patient was explored in view of collection in neck due to hematoma and wound lavage was performed and hemostasis secured from bleeding from muscles. In all patients anastomosis was done by nylon 8-0 suture with 4.5 X magnifying loop. In 54 patients (96%) arterial anastomosis was done with facial artery and another two patients it was done by superior thyroid and lingual artery. For venous anastomosis preferred vein of choice was internal jugular vein in 48 patients (86%) (End to side) followed by common facial in 4 patients (7%) and other unnamed tributaries in 4 patients (7%). Elective tracheostomy was done in all the patients either preoperatively or intraoperatively to ensure airway safety. In most patients the decannulation was done in 3rd-4<sup>th</sup> post-operative day after confirming flap viability and vital stability of patient. Three patients (5%) were kept on an invasive ventilator in post-operative period as per anesthetist decision and all three patients were weaned off in next morning. Intravenous unfractionated heparin 3U kg/hour (varied by aPTT) was used in 22 patients (39%) based on clinical judgement of surgeon depends upon many factors like technical aspects of micro-vascular anastomosis, lumen diameter and thickness of vessels. In all patients with intermittent knot one layer anastomosis was performed (from outside to inside) by Nylon 8-0 suture. Arterial anastomosis was performed first followed by venous anastomosis. Before opening the clamps of anastomosis, 100U/ kg unfractionated heparin bolus was administered in all patients. Perfusion of flap was confirmed by speed of blood flow and colour of blood in flap margins. Lie of anastomotic vessels were doubly confirmed to avoid torsion of vessels. After ensuring the anastomotic integrity and hemostasis wound closure was performed. Suction drain catheter was placed before closing the wound away from anastomotic site.

**Table 1: Epidemiology of cohort**

Median age	43 years (21 -71)
Male	46 (82%)
Female	10 (18%)
Addiction	92%
Mean duration of surgery	7 hour 20 minutes (5- 11 hours)
Mean blood loss	300 ml ( 100 to 1200 ml)

**Table 2: Surgical subsites of oral cancers**

<b>Buccal mucosa</b>	<b>24 (42%)</b>
Alveolus	16 (28%)
Retromolar trigone	8 (14.2%)
lip	4 (7%)
Palate	2 (3 %)
Tongue	2 (3%)

**Table 3: Types of flaps was performed for reconstruction**

<b>ALT flap</b>	<b>40 (71%)</b>
Radial fore arm	6 (10%)
MSAP	6 (10%)
Free fibula flap	5 (9%)

**Table 4: Complications of free flap surgery**

<b>Flap necrosis</b>	<b>3 (5%)</b>
Partial flap necrosis	1 (1.7%)
Bleeding	1 (1.7%)
Reexploration	3 (5%)
Wound dehiscence	3 (5%)
Oro-cutaneous fistula	0

## DISCUSSION

The first free flap was performed by Panje et al from Iowa in 1976 for reconstruction of oral cavity.<sup>[4]</sup> Today microvascular surgery become part of special training in surgical sub specialty. In few centers microvascular surgery is a part of training curriculum in residency.<sup>[5]</sup> On the other hand free flap surgery is long and mostly require two surgical team approach working together for harvesting of flap and another team for oncological resection.<sup>[6]</sup> Free flap procedure necessitate postoperative admission in intensive care unit, may require longer hospitalization and higher health care cost.<sup>[5-7]</sup> The problem of anastomosis usually develop in the first 24 hours, the endothelization of tunica intima is completed within 72 hours so complication of free flap rarely occurs after 72 hours.<sup>[8]</sup> The use of anticoagulants to prevent the development of thrombosis is still controversial [7]. Large series in the literature report reexploration rates of 8 to 9 % and flap success rates of 95 to 100%.<sup>[5-7]</sup> Our series reports were comparable to reports in the literature. Free flap was compared with pedicle flap in different studies suggested that free flap was associated with longer operative time and cost compared to pedicle flap.<sup>[6]</sup> Recipient site morbidity (oro-cutaneous fistula, wound infection, wound dehiscence and partial flap loss) was lower in free flap compared to free flap. Better speech quality, good swallowing function, better range of shoulder movement, better chewing movement , shorter nasogastric tube dependence, better cosmetic and function outcome was described for free flap compared to pedicle flap.<sup>[5-8]</sup> These all factors motivated our team to start free flap reconstruction in limited resource setting for better outcomes. All surgeries were performed in resource constrained settings with non-availability of operating microscope, lack of trained skilled assistant, single set of microscopic instruments with limited availability of fine sutures, financial constraints of costly medications, financial aspect of reexploration, need of vigorous post-operative monitoring of free flap with limitation of skilled manpower. Availability of ventilators, experienced head neck anesthetic team, dedicated team of surgeon, modern operation theatres with sterile environment

including modern OT light and OT table, skilled assistant in microscopic surgery, quality microscopic instruments, availability of thin sutures, availability of necessary medications like heparin, magnifying loops/ operating microscopes, skilled manpower for post-operative care and for rigorous post-operative monitoring of flap, adequate availability of blood products, proper counselling to patient and relatives and basic microsurgical training are the important prerequisite for better outcome of free flap even in resource limited settings.<sup>[7-10]</sup> Without arranging this prerequisite free flap surgery should not be performed. Limitation of our study was that all surgeries were performed by same group of onco and plastic surgeons and its retrospective nature of the study.

## CONCLUSION

Our study showed that with necessary basic prerequisite, free flap surgery can be performed safely with good outcomes even in resource limited settings. Starting free flap surgery is need of modern medicine to achieve better functional, cosmetic outcome and get advantage of pliability of free flap with less morbidity. Free flap surgeries need a surgeon's passion, dedication, optimal preoperative planning with optimal risk to achieve excellence for good outcomes. Free flap surgeries can be performed in large tumors that are quiet common in our setup because of delay in diagnosis with delaying in starting of the treatment.

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