

Original Research Article

Cervicofacial flap revisited

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ABSTRACT

Background: Cheek defect is difficult to reconstruct. The cervicofacial flap gives cosmetically good results with minimum scar and good colour match to the skin and skin texture. It is useful in elderly people because of skin laxity and their scars hidden well in wrinkles. It causes minimal morbidity.

Methods: We have studied 12 cases of cervicofacial flap in our series that underwent repair for a variety of cheek defects in our hospital from 2012 to 2015. We have used anterior based flaps. We have used subcutaneous flaps in the face and subplatysmal flaps in the neck. Their data collected and analysed.

Results: In our study mean age was 56 years and male to female ratio was 1:1. Defect size was ranging from 4x7 cms to 7 x 11 cms. The etiology was trauma in 5 cases, 2 cases of Basal cell Carcinoma, 2 cases of squamous cell carcinoma, 2 cases of angio-neurofibroma and one case of Hemangioma of face. All patients were satisfied with result of cervicofacial flap. FTSG used in four cases accepted very well. Mucosal advancement and Z-plasty in one case has given good result. PMMC in one case has done to reconstruct cheek. In one case Auricular cartilage used to reconstruct and support lower eyelid.

Conclusions: Cervicofacial flap is simple, easy to operate, consumes less operating time as compared to microvascular flap. It is less complicated and especially useful in diabetic, hypertensives and old debilitated patients with high risk of anaesthesia.

Keywords: Cervicofacial flap, Cheek defect, Head and neck reconstruction, Zones of face

INTRODUCTION

Cheek is the major anatomical component of face. It is related with important structures of face like nose, eyes, lip, lower eyelids. So defects of cheek are difficult to reconstruct without causing any deviations of the important facial structures. Cervicofacial flap gives cosmetically good results with minimum scar, good colour match of skin and skin texture.

It causes minimum deviations in relations to important structures around cheek. Cervicofacial flap is a good option for reconstructions of cheek defects. Mustard has used cervical rotation flap to reconstruct defects

around periorbital areas in 1969.¹ Kaplan in 1978 named this flap as a "Cervicofacial flap" he used it in many cases of head and neck reconstruction.²

Cervicofacial flaps have adapted to fit many defects of the face, cheek, parotid region, periorbital region, auricle and neck particularly in certain high risk patients such as old patients and those with systemic diseases or who for any reason cannot tolerate a long operative time.

Aims of study were to determine how Cervicofacial flap is effective in reconstruction of cheek defects, to assess whether it gives cosmetically and functionally good results without causing much deviations and deformity and to

study complications of Cervicofacial flaps and its safety and benefits in high risk and debilitated patients.

METHODS

Study included 12 cases of anteriorly based Cervicofacial rotation flap for cheek reconstruction at Lata Mangeshkar Hospital and NKP Salve institute of Medical sciences. Time period of our study was 2012 to 2015. Etiology included 5 cases of trauma, 2 cases of basal cell

carcinoma, 1 case of Hemangioma, 2 cases of squamous cell carcinoma and 2 cases of angioneurofibroma involving cheek. Mean age of patients in our study is 56 years. Male to female ratio was 1:1. 10 patients had defect or lesion in zone 1 of face and 2 cases are having lesion in zone 3. Defect diameter ranged from 4 x 7 cm and 11 x 7 cm. All flaps were elevated till they reached the defect easily without tension. The donor sites were closed primarily, except in 4 cases, which required full thickness skin grafting additional to primary closure.

Table 1: Patients details in present series, including etiology, post-operative recovery as well as additional procedures done.

Age (years)	sex Male/female	Etiology	Defect zone	Defect diameter (Cms)	Flap Complications	post op Recovery	Additional Procedures
50	M	Traumatic defect	1	4x6		Good	
55	M	Traumatic defect	1	5x7		Good	
60	F	BCC cheek	1	5x6	dehiscence	Healed conservatively	
62	F	BCC cheek	1	6x7		Good	
67	F	Angioneurofibroma	1	11x7		Good	FTSG On nose defect
64	M	Squamous cell ca SCC	3	9x4		Good	Mucosal advancement and z plasty
66	F	Angioneurofibroma	1	10x6	flap ischemia at tip	Good	FTSG, At medial area and nose
66	F	Squamous cell ca SCC	3	10x5	flap edema	Settled conservatively	PMMC flap to cover cheek inner mucosa defect
57	M	Hemangioma	1	11x7	flap ischemia distally	Settled well	FTSG, At medial part and lat nose
58	M	Traumatic defect	1	10x6	distal flap ischemia	Settled well	
35	M	Traumatic defect	1	5x7		good	auricular cartilage to reconstruct and support lower eyelid
40	F	Traumatic defect	1	6x7		good	

Foot note: m - male, f- female, FTSG-full thickness skin graft, cms- centimeters; BCC - Basal Cell Carcinoma, SCC - squamous cell carcinoma

Surgical technique

All patients were operated under general anesthesia in supine position, head of the patient rotated towards contralateral side and neck extended. Anticipated defect marked.

Decision made whether to base flap anteriorly. Design of the flap decided. Marking of flap was done. Superior aspect of flap was extended to the lateral canthus and slightly superior towards anterior hair line. The markings

then extended along the preauricular region, extended along ear lobule towards the mastoidal hair line behind ear, and then continued along inferiorly towards base of neck towards clavicle along anterior aspect of trapezius muscle.³

We take flap which is anteriorly based. Base of the inferior limit of the flap is above the clavicle in Cervicofacial flap. We used 4X loupe from Zeiss for dissection. It gives good visualization of proper planes and dissection around perforators.

For the defects involving medial cheek, incision extends superolaterally in slight upward directions above the zygomatic arch before extending to pre auricular region or line. So risk of ectropion is reduced.

Table 2: Types of cervicofacial flap.

Types	No of cases	Blood supply
1 Anteriorly based	12	Deep facial artery, submental artery, transeverse facial artery
2 Posteriorly based	0	Superficial temporal artery, post auricular arterial branches., transeverse facial artery
3 Cervico thoracic flap	0	



Figure 3: Squamous cell carcinoma right angle of mouth.



Figure 4: After excision of tumour intraoperative view.



Figure 1: Zones of face for cheek reconstruction.



Figure 5: After cervicofacial flap immediate post-operative.



Figure 2 (Case 1): Pre-operative view.

For very large defects involving lateral cheek zone 2, incision extended from lateral aspect of resection margin inferior to lobule and was carried to across mastoid tip into hairline.

The width of flap is approximately equal to maximum diameter of the defect, so there is no tension of the flap over the defect. The inferior incision was then carried medially approximately 90 degree for a distance, to allow sufficient rotation of flap to reach the defect.



Figure 6: Post-operative 1 month front view -front; minimal microstomia but good sphincteric action seen.

In present series during flap elevation, dissection is performed in the subcutaneous plane in face means flaps are raised superficial to the SMAS and parotidomasseteric fascia in face and deep to the platysma muscle in the neck. We have done anteriorly based cervicofacial flap (Table 2).



Figure 7: Post-operative 1 month; side view.

Flaps are raised sufficiently so that without tension they can be transferred to the defect and sutured in place over a drain.



Figure 8 (Case 2): Pre-operative and post-operative views of a case of hemangioma right side of face.



Figure 9 (Case 3): Pre-operative and post-operative view. A case of BCC right cheek zone 1 region of face.

RESULTS

In present series we have done 12 cases of cervicofacial flap during 2012 to 2015. In all cases we have done anteriorly based cervicofacial flap. Etiology of defects is shown in table no 1. 5 cases of trauma, 1 case of hemangioma, 2 cases of sq cell carcinoma, 2 cases of angioneurofibroma, 2 cases of BCC basal cell ca. In present series, complications -2 cases shown dehiscence partially and 2 cases developed partial ischemia of distal part of flap such as epidermolysis of distal flap.

All these cases responded conservatively. There is no case having full loss of flap or complete necrosis of flap. Full thickness graft in all cases taken well and has shown good aesthetic result. Additional z plasty done in one case has shown good result. In one case PMMC flap for cheek defect and cervicofacial flap for outer skin defect reconstruction has shown good outcome. All cases recovered well. Average admission was 5 to 7 days. Healing time was 3 to 4 wks. In majority cases cervicofacial flap added little extra time to overall length of surgery.

The cervicofacial rotation flap provided reliable coverage of the cheek defect in all 3 zones of facial defect. Zone soft faces are shown in Figure 1. All flaps shown good long term aesthetic and functional outcome. Figures of pre-operative and post-operative cases are shown. Figure 2-6. Shows pre-operative, intraoperative and post-operative pictures of the operated case of cervicofacial flaps in case of squamous cell carcinoma of angle of mouth right side in a 64 years old man in case 1. In case 2, pictures of Hemangioma of right side of face show pre-operative and post-operative photos. In case 3, a 60 years old lady was having BCC in Zone 1 region of cheek, pre-operative and post-operative result seen.

DISCUSSION

Replacement of cheek as a whole aesthetic unit is not possible many times. Reconstruction of cheek lesion varies according to size and location of the defect, Size of defect changes the treatment method. If the lesion less than 3 cms primary closure, 3 to 4 cms local flaps like rhomboid flaps and defects more than 4 cms then cervicofacial or other locoregional flaps. The rotation of locoregional tissues remains the mainstay of reconstruction in these areas. It can provide excellent skin colour and texture match, reduce surgical risk in high risk patients like old age, diabetic patients, un-controlled hypertension.

It is though random flap, cervicofacial flap gives good result in coverage of large defects of face. Coock et al delineated its goal in midfacial and cheek reconstruction.⁴ In addition to provide excellent skin colour, texture, thickness, the tissue should be flexible minimise distortion of the eye, upper lip, preserve facial movements and prevents ectropion. The Cervicofacial

flap matches all these criterias. They are also provides soft tissue cover for protection of facial nerve, mandible bone and arteries.

There are three zones of the face to classify facial defects according to Wang.⁵ We use anteriorly based Cervicofacial flaps with modifications. It provides suitable tissue coverage for cheek defects and good aesthetic appearance. Scars are camouflaged well especially in elderly patients with wrinkles. There are anteriorly and posteriorly based Cervicofacial flaps.

Blood supply of subcutaneous Cervicofacial flap is random pattern. Since it is elevated just below subcutaneous layer, multiple perforators to the skin which arise from deep facial artery, tranverse facial artery, and superficial temporal artery supply to flap by forming vascular channels. Deep plane Cervicofacial flap carries dissection below superficial musculoaponeurotic system in the face and deep to platysma in the neck.^{6,7} Thus flap becomes myofasciocutaneous with its axial blood flow. Anteriorly based flap derives its blood supply from submental artery and perforators of facial artery

In our series defects ranging from 4 x 6 to 11 x 7 cms were successfully covered with Cervicofacial flaps. Without the use of microscope or microsurgical techniques, we can do Cervicofacial flap .The operation is simple, operative time is short. The upper boundary of reconstruction with this method can reach the supraorbital margin. The medial boundary can reach the median line. The outer boundary can reach the preauricular region.

To prevent ectropion, Crow and crow, proposed that any flap in the region below the eye should have its superior margin sutured at point falling within triangle bounded by eyebrow, lateral canthus, and superior attachment of ear to the face.⁸ Any flap with superior margin below this triangle is likely cause ectropion based on scar contraction and weight of the flap. This description of an upcurving incision to prevent ectropion is found repeatedly in literature. To minimise risk of flap necrosis its advised by many authors to do deep plane dissection of flap. Elevation of flap in a plane deep to the SMAS sub musculoaponeurotic system in face and deep to the platysma in the neck to improve vascularity.^{8,11}

We do anteriorly based flap in the the in face in subcutaneous plane. They take their blood supply from branches of submental and facial arteries and in neck deep to platysma to improve its blood supply so it becomes myofasciocutaneous flap. Good result in our series as compared to other series may be because dissection in proper plane. In face we have done dissection in subcutaneous plane and in the neck dissection was deep to platysma, it increases axial blood flow as myofasciocutaneous flap.^{9,10} Tann shows, division of facial suspensory ligaments as a key to achieve great flap mobility.⁶ We closed donor defect primarily, except

in one case we put post auricular skin graft. In present series, in four cases, as our flap could not reach to medial end of the defect we used full thickness skin graft and it has shown good post op recovery with good cosmetic result. As compared to other studies we got better result with full thickness graft.

In one case we have done local mucosal advancement and cervicofacial flap with z plasty in lip region. This has given good functional outcome. Sphincteric action of lips well maintained with minimum microstomia, which was well accepted by patient. In one case as patient complaints about unwanted hair growth, we used IPL laser sittings to remove unwanted hairs on face.

In one case, in reconstruction of lower eyelid we used auricular cartilage to give stability to lower eyelid and simultaneously we covered the defect. In one case of sq cell carcinoma with composite defect we used pmmc flap to reconstruct cheek mucosa and cervicofacial flap to cover outer skin. Advantages of cervicofacial flaps are similar to other locoregional flaps in the head and neck. There is great colour-match, equal skin texture. Use of this flap enables placement of the scar in ideal location where it is camouflaged. Use of cervicofacial flaps is made easier in older patients due to likelihood of redundant tissues and rhytids which enables reconstructive surgeon to better hide final scars.

CONCLUSION

Cervicofacial flap is simple, easy to do, consume less operating time as compared to microvascular free flap. It is reliable, reproducible, technically and anatomically sound. It causes minimum complications. It is useful in high risk patients like diabetes mellitus, hypertension, old and debilitated patients as it consume less operative time and easy to perform. Cervicofacial flap gives good skin colour and texture match with the cheek skin than other tissues. We recommend this flap in cheek reconstruction.

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