

Archives of Plastic Surgery

TFL perforator flap – complementing and completing the ALT-AMT flap axis.

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DOI: 10.1055/a-2319-1564

Please cite this article as: Jaiswal D, Saxena B R, Mathews S et al. TFL perforator flap – complementing and completing the ALT-AMT flap axis. Archives of Plastic Surgery 2024. doi: 10.1055/a-2319-1564

Conflict of Interest: The authors declare that they have no conflict of interest.

Abstract:

Background: Antero-lateral thigh flap (ALT) is the most common soft tissue flap used for microvascular reconstruction of head and neck. Its harvest is associated with some unpredictability due to variability in perforator characteristics, injury or unfavorable configuration for complex defects. Antero-medial thigh flap (AMT) is an option, but the low incidence and thickness restricts its utility. TFL perforator flap (TFLP) is an excellent option to complement ALT. Its perforator is consistent, robust, in vicinity and lends itself with ALT perforator, to large conjoint flap, chimeric designs and possible two free flap harvest from the same thigh.

Methods: Analysis of 29 cases with a free flap for head neck reconstruction with an element of TFLP.

Results: All cases were primarily planned for an ALT reconstruction. There was absence of the ALT perforator in 16 cases but a sizable TFL perforator was available. In 13 cases the complex defect warranted use of both ALT plus TFL in a conjoint (5), chimeric (5) and multiple (3) free flaps manner. Most common perforator location was septo-cutaneous between the TFL and Gluteus Medius. There was complete flap loss in two cases and partial necrosis in two. No adjuvant therapy was delayed.

Conclusion:

TFLP can be used to counter ALT/AMT unavailability, injury, suboptimal quality or need of a thicker flap. Chimeric ALT-TFL can be harvested for large, complex, multicomponent and multidimensional defects. We recommend, harvesting flaps from the thigh with a non-committal straight line incision initially, perceiving ALT-AMT-TFL perforators as a unit.

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Accepted Manuscript

Title - TFL perforator flap - complementing and completing the ALT-AMT flap axis.

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Abstract:

Background: Antero-lateral thigh flap (ALT) is the most common soft tissue flap used for microvascular reconstruction of head and neck. Its harvest is associated with some unpredictability due to variability in perforator characteristics, injury or unfavorable configuration for complex defects. Antero-medial thigh flap (AMT) is an option, but the low incidence and thickness restricts its utility. TFL perforator flap (TFLP) is an excellent option to complement ALT. Its perforator is consistent, robust, in vicinity and lends itself with the ALT perforator.

Patients and methods: Analysis of 29 cases with a free flap for head neck reconstruction with an element of TFLP from July 2017 to May 2021.

Results: All cases were primarily planned for an ALT reconstruction. There was absence of the ALT perforator in 16 cases but a sizable TFL perforator was available. In 13 cases the complex defect warranted use of both ALT plus TFL in a conjoint (5), chimeric (5) and multiple (3) free flaps manner. Most common perforator location was septo-cutaneous between the TFL and Gluteus Medius. There was complete flap loss in two cases and partial necrosis in two. No adjuvant therapy was delayed.

Conclusion: TFLP can reliably complement the ALT/AMT axis. Chimeric ALT-TFL can be harvested for large, complex, multicomponent and multidimensional defects.

Keywords: Tensor fascia lata perforator flap, TFL perforator flap, ALT flap, Chimeric ALT harvest, Chimeric flaps

Introduction:

Anterolateral Thigh perforator flap has evolved to become a workhorse flap for Head & Neck (HN) reconstructions after cancer surgery[1]. Its harvest is still associated with an element of uncertainty due to variability in perforator characteristics; size, exact location in

thigh, course through Vastus Lateralis muscle and pedicle of origin [2, 3, 4]. This often translates into problems during harvest and partial or total skin island loss later. The Antero Medial Thigh flap (AMT), in presence of a suitable perforator, can be used as an alternative or add on chimeric option.[5]. The Tensor Fascia Lata Perforator flap (TFLP) can fulfil all these roles of AMT flap with greater predictability and consistency. TFLP or Lateral thigh flap with transverse incision is well described for autologous breast reconstruction as an opportunistic choice in presence of thick lateral upper thigh, mostly as a secondary or rarely primary choice. [6, 7]. TFLP in Head & Neck reconstruction is scarce in literature. Considering the incidence of HN cancer in the Indian subcontinent, lesser BMI in these populations and routine use of thigh as a free flap donor site, understanding the versatility of TFL perforator is crucial and can be a force multiplier. [8][Figure 1]. TFL perforator works synergistically with ALT for complex HN reconstruction. It yields certainty of flap harvest, robustness of vascularity, chimerism and option to harvest multiple free flaps from the same thigh.

Material and Methods:

Retrospective analysis of consecutive free flaps of HN reconstruction with a TFL perforator flap component (N=29), between July 2017 to May 2021, was done. Data was kept prospectively in, MS-EXCEL, hospital EMR and personal logs of first author. All these patients were planned for a free ALT flap. Doppler marking was done along the vascular axis (ASIS to Supero-lateral patella). A non-committal incision is taken 1.5 cm medial to this axis. In all these patients the incision was extended superiorly and posteriorly to look for the TFL perforator. Doppler signal was used in identifying the TFL perforator, which also guided the posterior extent of the incision.

Results:

During the study period 884 ALT flaps were harvested for head neck reconstruction of which 29 flaps (3.16%) were explored for a TFL component. Either due to the lack of an adequate ALT perforator or need for a chimeric configuration for reconstruction of a complex defects.

Table1 - Patient characteristics

TFL perforator was present in all 29 cases. In 16/29 cases the ALT or AMT perforator was inadequate thus flap was harvested only on the TFL perforator. In rest of 13/29 cases larger skin islands were needed or design requirement needed both ALT & TFL territories. 5/13 of these flaps were harvested as conjoint flaps. 5/13 as chimeric where both the ALT & TFL pedicles joined each other enabling a single set of microvascular anastomoses (MVA)[Figure 2]. In 3/13 cases the two pedicles were not joining or had multiple nerves entwined hence were harvested as two free flaps, needing two sets of MVA [Figure 3]. Table1 depicts design of flaps and average flap sizes.

Table 2 - Numbers and Flap Size in each category of TFL flap

The most common course of the perforator was Septo-cutaneous (between the TFL and Gluteus Medius) 27/29) followed by a Musculo-cutaneous course (Through the TFL muscle) (2/29) and no (0/29) case had a septocutaneous course between Rectus Femoris and TFL. 7/29 cases has multiple TFL perforators. 6/7 cases had 2 septo-cutaneous perforators and 1/7 had multiple musculocutaneous perforator. The length of the pedicle was sufficient for primary tension free anastomosis in all cases, no vein grafts were needed. Average pedicle length was 7 cm. All 19/29 patients planned, received post-operative radiation therapy on scheduled time.

27/29 flaps survived. Out of the 2 flaps lost (7.14%) 1 had venous insufficiency due to venous thrombosis and was replaced with a scalp flap. 1 patient, with past history of radiation, had arterial insufficiency and acute bleed due to anastomosis dehiscence. This lost flap was replaced by a pedicled latissimus dorsi flap. 2 flaps had marginal necrosis requiring secondary suturing only. There were no flap complications as a result of radiation therapy.

Donor site complication was present in 4 cases (13.79%). Donor sites were closed primarily for 17/29 patients of which 1 required re-suturing and 2 required secondary skin grafting. The average width in which the flap was closed primarily was 7.29 cms and the maximum was 12 cms. Skin grafting was done in 12/29 patients, of which 1 patient had partial graft loss which was managed conservatively.

Table 3- Master chart of all participating patients in the study, Microsoft Excel

Discussion:

The popularity of ALT flap is attributed to; donor site with abundant skin and soft tissue usually amenable to primary closure; generally robust perforators; long pedicle length and

sizeable lumen. The possibility of having an unfavorable perforator anatomy cannot be ruled out. Incidence as high as 5.4% has been reported. In such scenario the likelihood of finding a good perforator on the contralateral thigh is also unlikely [2,9]. The AMT flap, in presence of a suitable perforator, can be preferred over ALT or be used as salvage option in case of injury or in a complementary role as chimeric or additional free flap. Its low incidence restricts it in this role. [5]

TFLP can fulfil all these roles of AMT. Clinically and MRI/CT imaging studies show greater consistency in presence of TFL perforator as c.f. AMT. [10, 15, 16, 17][Figure 4]. In our high volume and resource constrained set up, preoperative imaging has cost and logistic compulsions hence not routinely used. A non-committal, free style, perforator to pedicle, based approach is advisable before committing to a flap incision and design [5]. The proximal and posterior extension of the straight-line non-committal incision can give a good exposure to the TFL perforator, guided with the handheld doppler signal. [Figure 5]. It is generally located 7-10 cm below ASIS and 4-6 cm behind the vascular axis of the ALT flap. A complementary relationship exists between perforators in the ALT, AMT and TFL territory supplied by different tributaries of LFCA.

TFLP (as lateral thigh flap) is well described for breast reconstruction as a rare primary or secondary choice [11]. Few case reports and series exist for TFLP use in HN reconstruction [1, 12, 15]. However, its larger application as a lifeboat or in complex head and neck defects has not been described in literature.

TFL muscle in the proximal thigh is enclosed within the ventral and dorsal layers of deep fascia. The possible perforators to the skin are:

1. Dorsal/Posterior Septocutaneous perforator/s generally one or two, large in size, travelling between the TFL and Gluteus Medius muscles. These are the most robust and consistent perforator as shown in our series as well.
2. Musculocutaneous perforators - Generally 1 -3 in number, small to medium size are present, traversing the substance of TFL muscle.
3. Ventral/Anterior Septocutaneous perforators; These are rare and travel in the 'ALT septum' or adherent to the ventral layer of deep fascia. Often mistaken for ALT or 'Oblique' branch perforators. [5]

The perforator is traced through this septum to the main pedicle (Transverse branch of LCFA) yielding a pedicle length between 6-9cms usually sufficient for HN reconstruction.

TFL perforator flap was preferred over a TFL musculocutaneous flap in our series. Visible perforators guarantee inclusion of the vascular basis in the flap, allowing small flaps (8x6 smallest in our series) and permits surgical thinning for superior contouring liberty and possibility of chimeric flaps based on same TFL pedicle (1 case in our series). Flap is thinner with longer pedicle length as muscle is excluded hence better suited for HN reconstruction.

Flaps with a TFL perforator flap component were harvested in the following situations and morphology.

1. **TFL perforator flap** - a single skin island flap, small or moderate size, was harvested when ALT/AMT perforator were unavailable, unsatisfactory or injured.
2. **Conjoint ALT-TFL perforator flap** - In some cases, a very large single skin island flap was needed, and the ALT perforators seem to be insufficient to sustain the whole flap. In these cases, a robust TFL perforator flap component can be added to the flap.

Hence, a larger skin flap can be harvested, encompassing the TFL and ALT territory while preserving their individual vascular supply. Recruitment of TFL would avoid marginal flap necrosis, especially when parts of skin are de-epithelized and turned for inset and contouring.

3. **ALT-TFL Chimeric perforator flap** – Used when large, multicomponent, multiaxial defect needing 2 skin islands were needed. ALT-TFL chimeric flap were harvested if pedicles were joining each other and it was possible to retrieve the flap without significant nerve damage or need to ligate too many branches. In case of intervening nerves ‘Divide and Deliver technique’ was used [13]. Now we prefer ALT-TFL combination over ALT – AMT, as it allows primary closure of donor.
4. **ALT and TFL perforator flaps** - In the above situation if the pedicles are not joining, joining but retrieval would entail significant nerve damage or too many branches to muscles especially Rectus femoris need to be ligated, two separate free flaps were harvested from the same donor site. [Figure 1]

The expendability of TFL muscle and donor site morbidity need consideration. TFL is a type 1 muscle hence harvesting the pedicle might render the muscle ischemic if not necrotic [14]. If any doubt of perfusion the muscle or a part of it was debrided. Occasionally , contrary to expectation as TFL is Mathes & Nahai Type 1 muscle, if the muscle was well perfused it was retained. Occasionally muscle might survive from proximal branches from superficial femoral vessels. The TFL muscle can be harvested as a chimeric component and be used for filling/sealing the maxilla or nasal cavity. The Iliac crest bone , around 4 cm anterior bone outer lip ,can also be harvested TFL muscle. TFL expendability is subject to debate . It only has a supportive role in hip and knee movement and stability and is not a

prime mover for any movement. Donor morbidity from sacrificing the TFL muscle can have effects over the gait initially. There isn't much objective data on long term functional outcomes. The argument stands that even with harvesting a large ALT (as an alternative to ALT + TFL flap), a significant deep fascia defect renders the muscle functionless as it loses its insertion.

The donor site, being over greater trochanter, should be preferably closed primarily without tension. Closures under tension tend to break down and may eventually require skin grafting over an unfavourable bed and poor cosmesis.

Incidence of complete flap loss in our study was 7 % (2/29). This can be attributed to previous radiotherapy (Arterial anastomotic dehiscence) and microsurgical technical error (Venous anastomotic thrombus) rather than the nature of the flap. Marginal necrosis in two patients could be due to the TFL perforator insufficiency in a large flap with average length of 25 cms. However, the incidence was low (7%) and was corrected promptly with secondary suturing without any delay in adjuvant therapy.

TFLP territory is conventionally thicker than the ALT territory and is our primary choice over ALT/AMT when small but thick flap is desired, especially in low BMI patients. The consistent presence, size and course of a septocutaneous perforator between the TFL and GM muscles, makes the TFL flap is an excellent back up and also allows for a definite ability to harvest a chimeric flap from the same donor site.

Conclusion:

TFL perforator is consistent and robust. We recommend, harvesting flaps from the thigh with a non-committal straight line incision initially, perceiving ALT-AMT-TFL perforators as a complementary unit. TFLP can be used to counter ALT/AMT unavailability, injury, suboptimal quality or need of a thicker flap. Chimeric ALT-TFL can be harvested for large, complex, multicomponent and multidimensional defects.

Conflict of Interest: none declared

Ethics approval

The study is a retrospective analysis of cases operated by a proven standard procedure and hence no ethical approval was required.

Consent was taken from all patients regarding the inclusion of clinical data and photographs in this study for the purpose of academic and scientific publication.

Funding: none

AUTHOR CONTRIBUTIONS:

Dushyant Jaiswal, Bharat Saxena, Saumya Mathews, Mayur Mantri, Vineet Pilia and Ameya Bindu performed the surgeries. Dushyant Jaiswal and Bharat Saxena had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Dushyant Jaiswal and Bharat Saxena wrote the manuscript. Vinay kant Shankhdhar and Prabha Yadav reviewed the manuscript.

Declaration of Helsinki

The study was done in adherence to the Declaration of Helsinki protocol. Proper pre-procedure consents were taken for surgery, documentation and research purposes. The study was approved by the Institutional Ethics Committee. Data storage was performed in accordance with good clinical practice guidelines.

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Figure 1 - Various ALT TFL flap configuration

1A - TFL perforator

1B – Conjoint flap

1C – Chimeric flap

1D – Double free flap

Figure 2 – Right BM SCC (Defect - SM + Upper alveolectomy + Skin Excision) reconstructed with Chimeric TFL and ALT flap

2A – In-situ Chimeric TFL and ALT flap

2B – Intra-operative Defect

2C – 6 Month Post-Operative result (Post Radiation)

Figure 3 – Bilateral BM SCC (Defect - B/L WLE of BM) reconstructed with Double FF (Free TFL and Free ALT)

3A – In-situ flap divided on ALT and TFL Perforator

3B – Divided Free ALT and Free TFL flap (Double FF)

3C – Intra oral defect with Free ALT inset over right BM defect

3D – 6 month post-operative figure (Post Radiation)

FIGURE 4 – CT Angiogram image of TFL perforator (TFLP) originating from the deep femoral artery (DFA) and emerging between the TFL muscle and Gluteus Medius (GM) muscle.

RF – Rectus Femoris ; VL – Vastus Lateralis

Figure 5 – Surface marking of the ALT and TFL flap territory and perforator location

A non-committal incision which is 1.5 cm medial to the vascular axis of the ALT flap (Anterior Superior Iliac Spine and the Supero-Lateral patella). To approach the TFL perforator the same incision is extended postero-superiorly guided by the hand held doppler signal.

Table1 - Patient characteristics

Demographics	Results
Age	Average - 51.81 years (30-69)
Gender	Male -20 Female -9
Pathology	SCC oral cavity - 28 Clear cell carcinoma Parotid -1
Preop therapy	Chemotherapy - 7 Brachytherapy-1 Radiotherapy -1

Table 2 - Numbers and Flap Size in each category of TFL flap

No.	TFLP flap type	Number	Maximum size	Average size	Mode of utilization
1.	TFLP flap	16	25 X 9 CMS	16.75 X 7.93 CMS	1.Mucosa only - 4

					<p>2.Skin cover only - 2</p> <p>3.Skin cover and Mucosal lining both -</p> <p>a. De-epithelized inset-9</p> <p>b. Divided Chimeric -1</p>
2.	Conjoint ALT + TFL	5	33 X 11 CMS	23.14 X 8.42 CMS	<p>1. ALT:</p> <p>a. Skin Cover - 3</p> <p>b. Mucosal Lining - 2</p> <p>2. TFL:</p> <p>a. Skin cover - 2</p> <p>b. Mucosal lining - 3</p>
3.	Chimeric ALT + TFL	5	26 X 8 CMS	22 X 7.5 CMS	<p>1. ALT:</p> <p>a. Skin Cover - 4</p> <p>b. Mucosal Lining - 1</p> <p>2. TFL:</p>

					<p>a. Skin cover - 1</p> <p>b. Mucosal lining - 4</p>
4.	Double Free Flap (ALT & TFL flaps from the same thigh)	3	<p>ALT - 25 X 12 CMS</p> <p>TFL - 13 X 7 CMS</p>	<p>ALT - 15.33 X 9.5 cm</p> <p>TFL - 10.75 X 8.6 cm</p>	<p>1. ALT:</p> <p>a. Skin Cover - 0</p> <p>b. Mucosal Lining - 3</p> <p>2. TFL:</p> <p>a. Skin cover - 2</p> <p>b. Mucosal lining -1</p>

Table 3- Master chart of all participating patients in the study

<u>Serial No.</u>	<u>Age</u>	<u>Primary diagnosis</u>	<u>Resection Sx</u>	<u>Configuration</u>	<u>Flap Size (cm X cm)</u>	<u>No. & course of TFL Perforators</u>	<u>Flap Usage</u>	<u>Donor Closure</u>	<u>Flap Complications</u>
1	54/M	Rt BM SCC	Rt SM + Upper alveolectomy + Total parotidectomy + ITF	Double FF	ALT - 25 X 12, TFL - 10 X 12	Multiple (MC)	TFL - Skin cover, ALT - Mucosal lining	PC	None

			Clearance + Skin						
2	30/ M	Rt BM SCC	Rt SM + Upper alveolectomy + Skin	Double FF	ALT - 9 X 7, TFL - 8 X 7	1 (SC)	TFL - Skin cover + filler, ALT - Mucosal lining	PC	Gaping of donor wound , secondari ly grafted
3	51/ F	Rt BM SCC	Rt SM + Upper alveolectomy + Skin	TFLP flap	25 X 9 (Flap Thinne d)	2 (SC)	Skin and Mucosal lining with de- epi	STSG	None
4	65/ F	Recc Rt BM SCC (Previ ous opera ted FRAFF)	Lt SM + Skin	TFLP flap	15 X 7	1 (SC)	Skin and Mucosal lining with de- epi and filler	PC	Re- suturing of donor wound
5	59/ M	Lt BM SCC	Lt WLE + MM + Upper Lip 50 %	TFLP flap	23 X 12 (Flap Thinne	2 (SC)	Skin and Mucosal lining	STSG	Flap marginal necrosis

					d)		with de-epi		requiring Secondary Suturing
6	36/ M	Lt BM SCC	Lt Hemi mandibulectomy + Skin	Conjoint flap	24 X 10	2 (SC)	TFL - skin cover, ALT - Mucosal lining with de-epi	STSG	None
7	61/ M	Lt BM SCC	Lt SM + Upper alveolectomy	TFLP flap	14 X 7	1 (SC)	Mucosal lining and filler	PC	None
8	49/ M	Rt BM SCC	Rt Hemi mandibulectomy + Upper alveolectomy + Skin	Conjoint flap	28 X 8	1 (SC)	TFL - skin cover, ALT - Mucosal lining with de-epi	STSG	None
9	67/ F	Lt BM SCC	Lt WLE + MM + Upper alveolectomy + Skin	Conjoint flap	20 X 8 (Flap Thinne d)	1 (SC)	TFL - skin cover, ALT - Mucosal	PC	None

							lining with de-epi		
10	69/ F	Rt BM SCC	Rt SM	TFLP flap	10 X 7	2 (SC)	Mucosal lining and filler	PC	None
11	42/ F	Rt BM SCC	Rt WLE + Upper alveolectomy + Palatal excision	TFLP flap	24 X 7	1 (SC)	Mucosal lining and filler	PC	None
12	52/ M	B/L BM SCC	B/L WLE	Double FF	ALT - 11 X 7, TFL - 13 X 7	1 (SC)	TFL - Left BM, ALT - Rt BM	PC	None
13	57/ M	Rt BM SCC	Rt WLE + MM	TFLP flap	8 X 6	1 (SC)	Mucosal lining	PC	None
14	48/ M	Recc Lower alveol us SCC	Mid SM + Upper alveolectomy + Skin	TFLP flap	19 X 11	2 (SC)	Skin cover	STSG	Total Flap loss due to Venous Insufficiency
15	59/ M	Clear cell	Total parotidectom	TFLP flap	10 X 7	1 (SC)	Skin cover and	STSG	None

		Ca Paroti d	y				filler		
16	44/ M	Lt BM SCC	Lt SM + Upper alveolectomy + Skin	Conjoint flap	20 X 8	1 (SC)	Skin and Mucosal lining with de- epi	STSG	None
17	43/ M	Lt BM SCC	Lt SM + Upper alveolectomy + Skin	Chimeric flap	TFL - 10 X 8, ALT - 14 X 8	1 (SC)	TFL - Mucosal lining, ALT - Skin cover	STSG	None
18	47/ F	Rt BM SCC	Rt SM + Upper alveolectomy + Skin	Conjoint flap	21 X 7	2 (SC)	Skin and Mucosal lining with de- epi	PC	None

19	52/ M	Rt BM SCC	Rt SM + Upper alveolectomy + Hemi glossectomy + Skin	Chimeric Flap	TFL - 8 X 7, ALT - 10 X 8	1 (SC)	TFL - Skin cover, ALT - Mucosal lining and tongue	STSG	Total flap loss due to arterial insufficie ncy
20	48/ M	Lt BM SCC	Lt SM + Upper alveolectomy + Maxillectomy + ITF clearance + Skin	TFLP flap	27 X 7	1 (SC)	Skin and Mucosal lining with de- epi and chimeric TFL muscle for maxillary defect	STSG	Flap marginal necrosis requiring Secondary Suturing
21	43/ M	Lt BM SCC	Lt WLE + MM + Skin	TFLP flap	12 X 6	1 (SC)	Skin and Mucosal lining with de- epi	PC	Donor re- grafting
22	34/ M	Tong ue	Near total glossectomy	TFLP flap	12 X 8	1 (SC)	Mucosal	PC	None

		SCC	+ MM				lining		
23	69/ F	Rt BM SCC	Lt Hemi mandibulectomy + Upper alveolectomy + Maxillectomy	TFLP flap	24 X 8	1 (SC)	Mucosal lining	PC	None
24	66/ F	Recc Lt BM SCC (Previous operated PMM C)	left BM WLE + Palatal excision + Skin	TFLP flap	16 X 8	1 (SC)	Skin and Mucosal lining with de- epi	PC	None
25	43/ M	Lt BM SCC	Lt SM + Upper alveolectomy + Skin + Maxillectomy	Chimeric flap	TFL - 17 X 8, ALT - 16 X 11 + vascula rised Iliac bone	1 (SC)	TFL - Mucosal lining, ALT - Skin cover	STSG	None

					graft 4 X 3.5				
26	68/ M	Recc Rt BM SCC (previ ous opera ted FFOC F)	Right SM + Upper alveolectomy + Skin	Chimeric flap	TFL - 16 X 8, ALT - 13 X 11	1 (SC)	TFL - Mucosal lining, ALT - Skin cover	STSG	Donor re- grafting
27	55/ M	Recc Lower lip SCC	Complete Lower lip excision and MM	TFLP flap	16 X 4	1 (SC)	Skin cover and Mucosal lining	PC	None
28	66/ F	Left lower alveol us SCC	Lt SM + Skin	TFLP flap	13 X 8	1 (SC)	Skin and Mucosal lining with de- epi	PC	None
29	32/ M	Lt BM SCC	Lt SM + Upper alveolectomy	Chimeric	TFL - 12 X 7, ALT	1 (SC)	TFL - Mucosal lining,	PC	Flap secondar

			+ Maxillectomy + ITF clearance		- 13 X 7		ALT - Skin cover		y suturing
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Legend of table 3

M – Male, F – Female, Rt – Right, Lt – Left, B/L – Bilateral, BM – Buccal Mucosa, SCC- Squamous cell carcinoma, Rec – Recurrent, Ca – Carcinoma, PMMC – Pectoralis Major Myo- Cutaneous flap, FRAFF – Free Radial Artery Forearm Flap, FFOCF – Free Fibula Osteo- Cutaneous Flap, TFL – Tensor Fascia Lata, TFLP – Tensor Fascia Lata Perforator, ALT – Antero-Lateral Thigh, SM – Segmental Mandibulectomy, MM – Marginal Mandibulectomy, ITF – Infra-Temporal Fossa, WLE – Wide local Excision, SC – Septocutaneous (Between TFL and Gluteus Medius), MC – Musculocutaneous, STSG – Split thickness skin graft, PC – Primary closure







