Retrospective Study On Results Of Full Thickness Skin Graft To Cover Radial Forearm Free Flap Donor Site Defect

Dr. Gunjan Shah*, Dr. Vipul Nagavadiya, Dr. Gyanendra Misra*****

*Associate Professor, GCS Medical College Hospital And Research Center, **Assistant Professor, Government Dental College Ahmedabad, ***Consultant Maxillofacial And Head Neck Surgeon

Abstract: Background: Considering the burden of oral cancers in Indian subcontinent many patients undergo ablative surgery for oral cancer. Buccal mucosa and tongue are commonly affected due to etiology being chewable tobacco. Radial forearm flap is commonly selected to reconstruct buccal mucosal or tongue lining. Material And Methods: 100 patients are selected who underwent ablative surgery and reconstruction by free radial forearm flap. Full thickness graft was harvested in all those form groin area and groin was closed primary. The results were evaluated for graft take, aesthetic appearance and hand functions from grade 1 to 5. Result: In most of patients graft take was almost 100%. Epidermal loss was noted in some patients but dermal take was present. None of the patients required to undergo re-grafting or debridement for forearm. Majority of patients were in grade V; 82 for cosmetic analysis and 83 for functional analysis. Mean value for cosmetic was 7.73±0.7 and for functions it was 4.78±0.52. Conclusion: **F**ull thickness skin graft provides stable and better outcomes. Graft loss is a major fear but is good technique and post op care if taken, that serves as much better option. [Shah G Natl J Integr Res Med, 2023; 14(3): 28-30, Published on Dated: 18/05/2023]

Key Words: Radial Forearm Free Flap, Full Thickness Skin Graft, Graft Take, Aesthetic Outcome

Author for correspondence: Dr. Gunjan Shah, Associate Professor, GCS Medical College Hospital And Research Center, Ahmeabad E-Mail: Ghs_48@yahoo.com Mobile: 9328993539

Introduction: South Asia and Indian subcontinent are areas where smokeless tobacco consumption is seen wide spread. This leads to development of carcinoma of buccal mucosa commonly[1,2].

Surgical excision and neck dissection are commonly the choice of treatment as ablative surgery. Buccal mucosa provides lining for mouth and similarly tongue defects also requires replacement in form of lining. Radial forearm flap is a common choice of flap for such reconstruction.

Radial forearm flap is easy to harvest, has good pedicle length and diameter of vessels and superficial system of veins is also available.

The major disadvantage of this flap is requirement of graft to cover donor site and resultant depressed scar. Usually split thickness skin graft is used to cover donor site deformity but cosmetic results are not comparable. We have used full thickness skin graft (FTSG) and studied their take, and aesthetic results.

Material & Methods: We had done retrospective cohort of 100 patients. Informed consent was taken from all the patients as per declaration of Helsinki 1964.

Inclusion Criteria: Radial forearm flap was harvested as form of reconstruction. Full thickness skin graft (FTSG) was used to cover donor site defect.

Exclusion Criteria: Cases where primary closure was obtained over donor site. Patients suffering from skin disorders that influence take of graft.

In all patients Allen's test was performed preoperatively to check ulnar flow. We had chosen non dominant limb as donor site. Under tourniquet by standard technique proximally based skin paddle was marked and subfascial flap was harvested. Care was taken to preserve paratenon over flexor muscles. Tourniquet was deflated once flap is raised. Flow through the flap was checked and pedicle was ligated noting ischemia time. The wound was flushed with normal saline and primary closure of primal site was done in 2 layers.

Full thickness skin graft was taken form groin fold as thin as possible with help of BP blade and handle. Graft was perforated and placed over forearm defect and secured with non-absorbable sutures. Vaseline gauze and bolster was secured with sutures over graft to secure the graft. Dressing was done and neutral position splint

was given. After 5 days dressing was done and after 9 to 10 days 2nd dressing was done. We check graft take and presence of infection to donor site. Sutures were removed on 10th post op day.

Results: We had carried out survey on all patients based on following parameters on grade of 1 to 5. Grade I is least acceptable and grade V is most acceptable cosmetic appearance or functional outcomes. Cosmetic evaluation was based on stony brook's scar evaluation score. Cosmetic analysis (colour and depth matching with rest of forearm) Functional outcomes (Hand movements, contractures).

Table 1: Acceptance of Cosmetic Analysis Vs Functional Outcomes

	Grade I	Grade II	Grade III	Grade IV	Grade V
Cosmetic Analysis	1	3	6	8	82
Functional Outcomes	0	0	5	12	83

From the results we can extrapolate that those patients with better cosmesis had better functions.

We did Chi square test to check for correlation but p value is 0.578 so is statistically insignificant. Mean value for cosmetic was 4.73 with standard deviation 0.70 and mean value for functions was 4.78 with standard deviation 0.**52.**

Discussion: Radial forearm flap was first documented by china and was published first as free flap by Yang in early 1970s[3]. Later use was also published as pedicled flap for proximal hand reconstruction[4,5].

Early stable soft tissue coverage is recommended to allow early mobilization and to reduce treatment length and cost. Local flaps have many limitations and so free flaps are the choice of treatment for those.

There are many flaps that provide soft tissue coverage including anterolateral thigh flap, medial sural artery flap and parascapular flap but radial forearm gives best replacement as lining[6,7,8]. The advantage of flap is easy to harvest, good pedicle length and good diameter of vessels which makes it more reliable and predictable.

The major drawback of that is need of graft to cover donor site[6,9].

There are various ways to manage donor site but we found four main methods of closure of the donor site: full-thickness skin grafts (FTSG); split-thickness skin grafts (STSG); modified techniques for raising the flap and closure of the wound by local flaps; and others (such as allografts, expanders, and vacuum bandages[10]. The donor site can be closed primarily if the flap is harvested less than 5-cm wide. Primary closure may be achieved in many cases still need of graft cannot be avoided in all patients[11,12]. Split thickness skin graft is usually chosen to cover

donor site as graft take is more predictable compared to full thickness graft. Many studies have been done to compare results of split thickness versus full thickness skin graft[13].

For any closure special attention should be paid to the coverage of the flexor tendons. FTSG give better aesthetic results than STSG.

Closure by local flaps may achieve primary closure of the donor site without a third surgical site, but the techniques are limited by the amount of tissue required at the site of the defect[10].

Dressing also pays very important role for graft take. Suction dressings or firm dressing to secure the graft in place over tendons is necessary. Movement of fingers should be restricted in initial postop period to facilitate take of graft[14,15].

In our study with proper technique and postoperative protocols we had not seen any case with complete loss of graft. Epidermal loss was seen in about 12 cases but total dermal loss was not noted in case.

Need for any further re-exploration or second surgery was also not needed in any of our cases. Longer dressing was needed in those with epidermal loss but re-grafting was not needed. We have followed up patients for scar massage with oil and hand physiotherapy to allow mobilisation of flexor tendons. In any of our

series we had not noticed contracture or flexion deformity of donor site.

Conclusion: We recommend use of full thickness skin graft for coverage of radial forearm donor site. It gives same predictable take of graft and better aesthetic results. Still more studies are required to validate its significance. Post-operative care and dressing is also very important for graft take.

References:

1. Prakash C. GUPTA, Cecily S. RAY. Smokeless tobacco and health in India and South Asia First published: 04 November 2003 RespirologyFree Access
2. GauravGoyal* and Basavaraj T Bhagawati. Knowledge, Attitude and Practice of Chewing Gutka, Areca Nut, Snuff and Tobacco Smoking Among the Young Population in the Northern India PopulationAsian Pac J Cancer Prev. 2016; 17(11): 4813–4818.
3. Yang GF, Chen B, Gao Y. Forearm free skin flap transplantation. Natl Med J China. 1981; 61:139–142.
4. Lu KH. The forearm radial arterial turnover flap and its clinical applications. ZhonghuaWaiKeZaZhi. 1982;20(11):695–697
5. Stock W, Muhlhauer W, Biemer E. The neurovascular forearm island flap. Z PlastChir. 1981; 5:158–165.
6. Germann G, Bickert B, Steinau HU, Wagner H, Sauerbier M. Versatility and reliability of combined flaps of the subscapular system. PlastReconstr Surg. 1999; 103:1386–1399. doi: 10.1097/00006534-199904050-00007.
7. Godina M. Early microsurgical reconstruction of complex trauma of the extremities. PlastReconstr Surg. 1986; 78:285–292.
8. Gohla T, Kehrer A, Holle G, Megerle K, Germann G, Sauerbier M. Functional and aesthetic refinements of free flap coverage at the dorsum of the hand and distal forearm. Unfallchirurg. 2007; 110:5–13. doi: 10.1007/s00113-006-1203-5.
9. Muhlbauer W, Herndl E, Stock W. The forearm flap. PlastReconstr Surg. 1982; 70:336–344.
10. Is there an ideal way to close the donor site of radial forearm free flaps?Pabst AM, Werkmeister R, Steegmann J, Hölzle F, Bartella A.Br J Oral Maxillofac Surg. 2018 Jul;56(6):444-452.
11. [Rotation and advancement of the radial-based fasciocutaneous flap for primary closure of the radial forearm flap donor defect].Zhengyang G, Canhua J, Jie C, Limeng W, Hui R, Fuqiang L, Chunrui H, XinchunJ.Hua Xi Kou Qiang Yi XueZaZhi. 2016 Oct 1;34(5):478-482.
12. Novel technique for the direct closure of the radial forearm flap donor site defect with a local bilobed flap.Mashrah MA, Lingjian Y, Handley TP, Pan C, WeiliangC.Head Neck. 2019 Sep;41(9):3282-3289.
13. Objective and Subjective Comparisons of Split Thickness Skin Graft and Full Thickness Skin Graft for Radial Forearm Flap Donor Sites Using a New Measuring Method.Peters F, Smit N, Möhlhenrich SC, Bock A, Kniha K, Raith S, Hölzle F, Modabber A.J Craniofac Surg. 2021 Sep 1;32(6):e594-e598.
14. Full-thickness skin graft from the neck for coverage of the radial forearm free flap donor site.Hanna TC, McKenzie WS, Holmes JD.J Oral Maxillofac Surg. 2014 Oct;72(10):2054-9.
15. Functional and cosmetic donor site morbidity of the radial forearm-free flap: comparison of two different coverage techniques.Pirlich M, Horn IS, Mozet C, Pirlich M, Dietz A, FischerM.Eur Arch Otorhinolaryngol. 2018 May;275(5):1219-1225.

Conflict of interest: None
Funding: None
Cite this Article as: Shah G, Nagavadiya V, Misra G. Retrospective Study On Results Of Full Thickness Skin Graft To Cover Radial Forearm Free Flap Donor Site Defect. Natl J Integr Res Med 2023; Vol.14(3): 28-30