ORIGINAL RESEARCH PAPER

Plastic Surgery

A STUDY ON RESULTS OF EFFICACY OF THE RHOMBOID FLAP IN RECONSTRUCTION OF FACIAL SOFT TISSUE DEFECTS IN A TERTIARY CARE HOSPITAL

KEY WORDS: Facial soft tissue defects, Rhomboid flap, Limberg flap, Local flaps.

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ABSTRACT

Background: Traumatic injury to the face can cause significant deficits and poor aesthetic outcomes. Thus, it is essential to be versatile and have adequate knowledge of pertinent techniques for reconstruction of facial soft tissue defects. The rhomboid transposition flap, proposed by Alexander Limberg, is an extremely useful flap for a wide range of reconstructive procedures. This flap can be easily designed, does not require any special instruments, and provides excellent contour, texture, color match, long-term aesthetic appearance and high patient satisfaction. This study aims to demonstrate the versatility, safety and utility of the rhomboid flap for reconstruction of soft tissue defects of the face. **Study design:** Prospective, interventional, institution based, conducted at Apollo Multispeciality Hospitals, Kolkata, India. **Method:** Our study includes 10 patients operated over a period of 6 months; all patients underwent reconstruction of facial soft tissue defects with rhomboid flap. All patients were followed up for 1 year without any significant complications. **Conclusion:** The rhomboid flap provides safe and predictable outcomes, and is the method of choice for most of the facial defects encountered.

INTRODUCTION

The "reconstructive ladder" concept has origins in ancient Egyptian medical texts that were written sometime between 2600 and 2200 BC. The principle suggests that the simplest effective technique should be considered first in reconstruction [1]. However, at times, primary closure or skin grafting techniques may lead to increased likelihood of dehiscence, distortion of key structures, poor cosmetic outcomes, especially in facial soft tissue defects[2]. In these situations, local flaps with pliability, matching texture and color become the best option. Among such flaps, a rhomboid flap is a versatile option for reconstruction [3]. There are a number of studies in the literature on the use of rhomboid flap in every area of the human body and in various soft tissue defects. It can be used in almost any part of the body, and is widely used in facial reconstruction.

Professor AA Limberg of Leningrad devoted his entire career to flap design, publishing first on the subject in 1928. His first treatise in English was a chapter in *Modern Trends in Plastic Surgery,* edited by Thomas Gibson of Glasgow University (Glasgow, Scotland) in 1963 [4]. In that chapter, he outlined his rhomboid flap. It is basically a parallelogram with two angles of 120 degrees and two of 60 degrees. These angles, of course, can be modified depending on the shape of the lesion or defect. All sides of the rhomboid and all sides of the flap are equal. As many as four flaps can be raised from one rhomboid, if required. Unlike other local flaps, the rhomboid flap can be used in virtually any sized defect and any part of the body. Borges has suggested that in facial reconstructions, flaps are preferable to primary closure and/or skin grafting even for small defects [5].

This study aims to demonstrate the versatility, safety and utility of the Rhomboid flap for reconstruction of traumatic facial soft tissue defects. The flap fills the defect with tissue of the same color and contour, has good vascular supply, and demonstrates excellent functional and aesthetic outcomes.

METHODOLOGY:

This prospective, interventional, institution based study was conducted at Apollo Multispeciality Hospitals, Kolkata, and included 10 patients in the age group of 20-70 years, presenting with facial soft tissue injuries operated over a period of 6 months – during January 2022-June 2022; After appropriate positioning of the patient, the area to be reconstructed was marked with a rhomboid design and a rhomboid flap was marked adjacent to the defect; adjacent tissue was examined, and location of the rhomboid design was based on laxity of the donor area. Under aseptic precautions, the flap was harvested, the level of dissection being relatively superficial, maintaining 2–3 mm of subcutaneous adipose tissue. All patients were discharged the next day. Postoperatively, the patients were instructed to use antibiotic ointment twice daily along suture lines. Skin sutures were generally removed in 7 – 10 days.

RESULTS

No flap dehiscence or necrosis were noted; only one flap developed hypertrophic scar; which successfully resolved with intralesional steroid injections.

Table 1 – General Details

SERIAL NO	AGE IN YEARS	COMPLICATIONS	PATIENT SATISFACTION
1	22	NIL	FAIR
2	35	NIL	VERY GOOD
3	28	NIL	VERY GOOD
4	32	NIL	VERY GOOD
5	35	NIL	GOOD
6	23	NIL	VERY GOOD
7	26	SCAR YPERTROPHY	FAIR
8	31	NIL	VERY GOOD
9	37	NIL	VERY GOOD
10	39	NIL	VERY GOOD

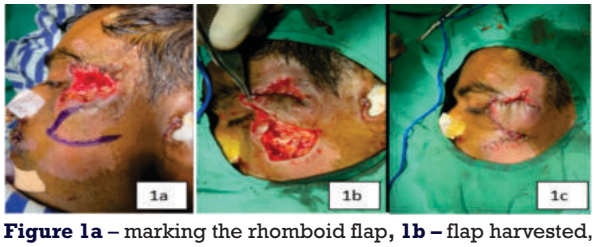

Figure 1a – marking the rhomboid flap, **1b –** flap harvested, **1c** – flap inset.

Figure 2a – rhomboid flap planned, **2b –** flap inset and donor area closed, **2c** – 3 months follow up.

CONCLUSION

The Rhomboid flap provides for closure of small to large facial soft tissue defects, with a high level of safety and predictability and a low incidence of complications. The flap is easily harvested without any tension in the donor site closure, making it the first option in most facial reconstructions. To summarise, the predictability, technical ease, the final aesthetic outcome, short operative time, good skin texture and color match, without any loss of function, tension-free closure, and need of lesser follow up visits are some of the reasons to justify the extensive application of rhomboid flaps in facial reconstruction.

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