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Fish-Mouth Modification of VY Advancement Flaps Revisited

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Abstract: ***V-Y advancement flap is a procedure with widespread indications. It is a common flap used for defects of face, trunk and extremities. Many variations of this flap have been reported, depending upon the movement which it needs to undergo (pure advancement, rotation with advancement); or the number of flaps used. The flap advancement is limited by the laxity of the underlying tissues and vessels. Also, as most excisional defects are elliptical or circular, it makes closure at centre of defect difficult. There is usually some extra tissue left at the edges after advancing the flap, which is unutilised in most V-Y flaps. Here we describe the less reported use of "horns" of extra tissue to facilitate closure of a V-Y flap. The horns on both sides are fed into the centre of the defect, which results in a fish-mouth type closure. The robust vascularity of a V flap provides circulation to these "horns". In areas where sufficient tissue for making a long enough V-flap is not available, this modification can be used. This technique is also useful when the flap advancement is limited or when closure at the centre of defect becomes difficult.***

Keywords: V-Y flap, fishmouth modification

1. Introduction

The V-Y flaps are one of the most popular flaps based on a subcutaneous pedicle. They have been popular for coverage of defects of the face, trunk and extremities.[1,2,3,4] Traditional V-Y flaps are advancement flaps, but modifications like rotation[5], undermining,[6] or extending the flap around the defect[7] have also been reported.

Conventional V-Y flaps had less mobility as they were thought to have a random pattern vascularity. The distance to which a V-Y flap can be advanced depends on laxity of the underlying tissues, which also carry vessels to the flap. With the advent of perforator localisation for almost all flaps, selective undermining has been advocated for V-Y flaps as well[6]. As noted by Aoki et al most excisional defects are somewhat circular in nature, which makes the base of the triangle somewhat concave.

The opposite edge also being concave makes closure at the centre difficult.[8]

Niranjan et al[9] had first suggested a fish-mouth variation of the V-Y advancement in the lower leg, where the advancing ends of the flap are fed into the concavity at the centre, which helps to transform the advancing flap edge from concave to convex. They had described it for small defects in the lower leg region. This modification helps to close the defect with less tension and utilises the tissue at margins which was in excess. Except for the study by Niranjan et al, this modification has been reported only for a defect on the back.[10]

For an elliptical defect in the posterior thigh, we used the principle of fish-mouthing a V-Y flap to achieve tension-free closure. V-Y advancement flaps from the posterior thigh region are done for ischial pressure ulcers. But when such a defect approaches the posterior thigh region, closure with a conventional V-Y flap might be difficult due to limited tissue available from thigh.

2. Methods & Planning

Marking of the flap is done as for a conventional V-Y flap. The base is kept towards the defect, and a triangle is marked along the axis and laxity of the available tissue. In the patient described here, the tissue available was on the posterior thigh or the gluteal region. Since the defect was below the gluteal fold and extending more towards the thigh, any flap from the gluteal region would have reached with difficulty. So, the maximum available tissue from posterior thigh was marked as a triangle, with the apex towards the popliteal fossa. Since the defect was elliptical, the tissue at the margins of triangle was more than that in the centre.

3. Case Report

A male patient aged 14 years with an excisional biopsy scar on the posterior thigh, reported as Malignant spindle cell rhabdomyosarcoma underwent a Whoops excision of the scar. This left an elliptical defect of 16X10 cm in the upper posterior thigh. Perforator marking was done on the posterior thigh, a single perforator was located 12cm above the popliteal crease. The maximum possible length of V-Y flap was planned on the posterior thigh region, with the apex of the triangle positioned towards the popliteal crease [Fig 1]. The flap was raised by incising along all margins up to the fascia. The apex of the flap was undermined till the perforator in the intermuscular septum was visualised. The "horns" at the base were also undermined. They were approximated at the centre of the defect with a triangulating suture [Fig 2]. One margin of the horns was sutured to the edge of defect; the other margin was sutured to opposite horn. The Brachytherapy ports were inserted, and rest of closure was done in single layer [Fig 3].

Even with the Brachytherapy ports inserted, the vascularity of the flap "horns" was not compromised and the flap healed well [Fig 4]. The dog ear which formed had started settling down when the patient was seen on last follow up.

4. Conclusion

The excisional defect in our case was well below the ischial region, which is the area where pressure ulcers are usually seen. So, the tissue available to facilitate advancement was lesser than usual. As described, we were able to utilise excess tissue from the margins to our favour and achieve tension free closure. So, fishmouthing is a useful modification of V-Y flap, which helps to achieve tension free closure in difficult cases.

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Figure legends

Figure 1: Defect on the right posterior thigh, with the V-flap after completing incisions

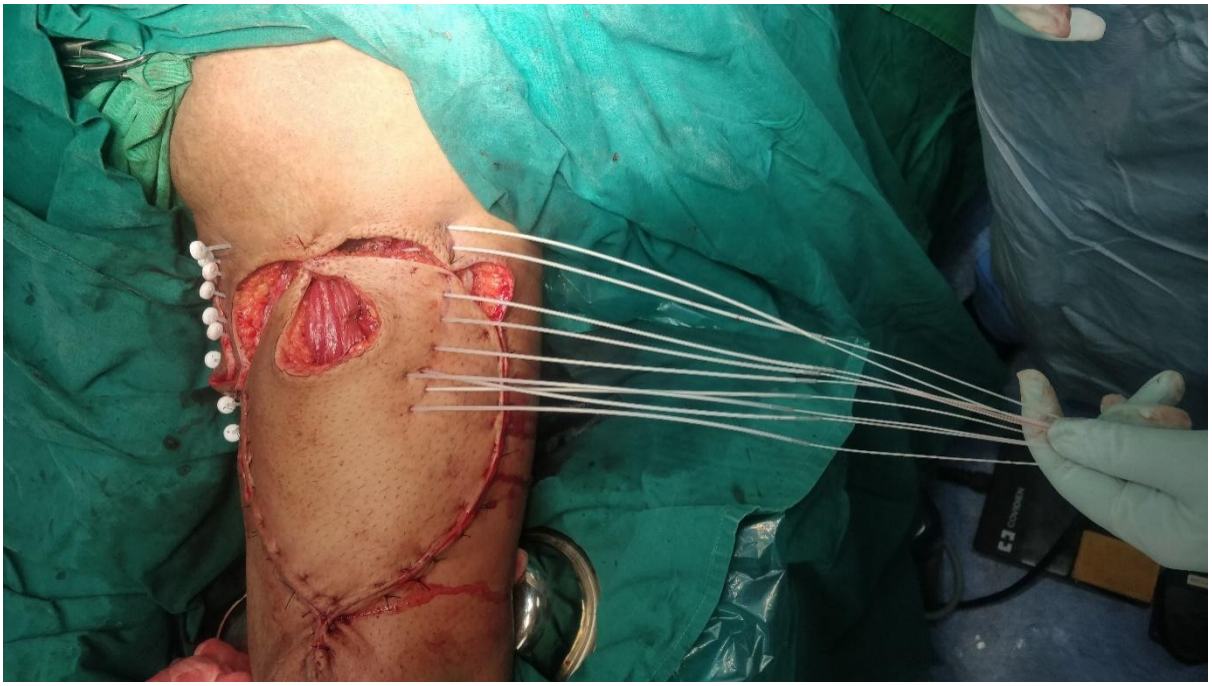

Figure 2: The V flap with its "horns" approximated across centre of defect.

Figure 3: Appearance on table after final closure (brachytherapy ports are seen in situ)

Figure 4: Post op Day 15, after completion of brachytherapy and removal of ports