Abstract :
Dorsal defects of forearm are usually corrected by groin flap or abdominal flap or a free flap. Defects of whole of dorsal forearm upto elbow are difficult to cover by groin or abdominal flap. We here are presenting a pedicled flap by name Thoracoumbilical flap for the coverage of such defects of dorsal forearm. Thoracoumbilical flap is harvested from anterior trunk based on perforators from deep inferior epigastric artery. A dorsal forearm defect extending from elbow to wrist was covered by a pedicled thoracoumbilical flap. Patient had comfortable post operative course and flap division and inset was given after a delay. Flap healed well and the donor site scar was acceptable. Flap does not require thinning. Pedicled Thoracoumbilical flap is reliable, easy to harvest and has high length to width ratio thus helping to cover large forearm defects and can be used as first line flap.

Keyword : Thoracoumbilical flap, Deep inferior epigastric artery, Delay, Inset and Perforators.

INTRODUCTION :
Taylor and Boyd described about the vascular anatomy of Thoracoumbilical flap in 1975, subsequently only a few papers were presented and the flap was relegated to second line flaps for forearm coverage next to groin flap and abdominal flap. The reach of groin flap is questionable in proximal forearm defects. Hence thoracoumbilical flap was planned. Here we describe our experience with the flap.

MATERIAL AND METHODS :
A female patient aged 19 yrs with a post traumatic raw area over the dorsum of forearm extending from elbow joint to dorsum of wrist with exposed radius and muscles was chosen. Thoracoumbilical flap upto a length of 21 cms and width of 6 cms
elevated from anterior trunk and used to cover the defect. Flap division and inset was given after 3 weeks. The flap was observed for a period of 3 weeks and followed up for 3 months for complications.

**VASCULAR ANATOMY:**
Thoracoumbilical flap is a flap that is raised on the anterior abdominal wall based on the paraumbilical perforators of the deep inferior epigastric artery which is a branch of external iliac artery (fig-1). (FIG-1) The DIEA (deep inferior epigastric artery) enters the posterior rectus sheath at the level of arcuate line and runs within it. At the level of umbilicus, it gives of perforators which pierce the rectus sheath and travel laterally on the fascia of anterior abdominal wall and anastamose with the perforators of intercostal artery (fig2). (FIG-2-anatomy of perforators)

**OPERATIVE TECHNIQUE:**
Pre operatively the perforators of DIEA are marked with doppler. Planning in reverse is done to calculate the length of flap required. If the flap required crosses the midaxillary line a delay is needed (fig 3)

**Flap design (fig 3)**
The flap can be extended up to 5 cms from the posterior midline with delay. The width of the flap that is raised is assessed by pinch test. It is the amount of skin that can be pinched with the palm of hand in the anterior abdominal wall. This test is done to determine if the donor site can be closed primarily or requires skin grafting. If the width of flap is less than the pinch, skin donor site can be closed primarily. The length of flap is from the lateral border of rectus sheath to midaxillary line, with delay this can be extended up to 5 cm from the posterior midline. The flap is elevated from lateral to medial with the inclusion of thin fascia covering the muscle (fig 4).
Raising of the flap (fig 4)
The medial extent should stop at the lateral border of rectus, it can be extended medially by dividing the rectus muscle and isolating the DIEA so the flap is pedicled on DIEA. Flap is delayed in stages from 14 to 21 days, division and inset is done on 21st day.

CASE SUMMARY:
A young girl of 19 yrs of age who met with road traffic accident with loss of skin and subcutaneous tissue of entire dorsum of forearm with exposed underlying muscles and radius. The defect size was 7 cm in width and 20 cms in length (fig 5). Planning in reverse was done and flap marked (fig 6). Thoracoumbilical flap was raised upto midaxillary line including the fascia and inset given (fig 7, 8 & 9).
The donor site was primarily closed. Patient developed wound gaping at the donor site. Donor site was skin grafted on 14th day. Flap delay was done in stages beginning on 14th day and division and inset given on 21st day. RESULTS - The results were analysed with respect to the flap and its donor site. At 3 wks the flap settled well with no infection or haematoma, the colour match of donor with that of recipient was good. The skin grafted donor site healed well, in females the exposed donor scar is a disadvantage. (fig 10) (fig 11).

DISCUSSION:
Advantage of thoracoumbilical flap being its reliability, ease of elevation, definitive pedicle without anatomic variation, thinness and suppleness, lesser learning curve, useful in emergency situation and reduced morbidity for the patient with decreased joint stiffness. The length width ratio with this flap is more thus helping in covering wounds extending upto elbow. Disadvantages being requirement of delay on crossing the midaxillary line and exposed donor site scarring.

CONCLUSION:
Thoraco umbilical flap is versatile flap for dorsal forearm and hand defects, its usefulness in emergency settings and ease with which it can be raised and its reliability make it a very useful flap in dorsal defects of forearm. It can be considered as a first line flap in forearm defects.
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