V-Y tensor fascia lata for trochanteric pressure sore treatment

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For quite some time, pressure sores in paraplegics have been a serious problem. However, it was after World War II, with Conway and Griffith’s publications (1) that surgical treatment of these lesions received an important impetus.

Pressure sores are a public health problem. They elevate costs, both from the standpoint of the patient’s suffering and financially to society. In the United States, approximately 60,000 patients die annually from complications related to pressure sores (2).

In the late 1970s when Nahai et al (3) published their pioneer work, the tensor fascia lata was used as a free flap and as a local rotation flap. Its use as a free flap was significantly reduced when better alternatives appeared. Nevertheless, its effectiveness for coverage of the trochanteric region is unquestionable.

The V-Y advancement flaps can be reused when necessary. This represents great progress for paraplegic patients, in whom recurrence is frequent.

The purpose of this study was to analyze the advantages of the V-Y tensor fascia lata for the treatment of trochanteric ulcers and to compare it with the reconstructive methods described in the literature.

PATIENTS AND METHODS
From 1990 to 1994 20 patients, 18 males and two females, underwent surgery. Operations were performed at the Plastic Surgery Service of the ‘Santa Casa de Misericordia’, Ribeirão Preto and the Hospital Santa Catarina, São Paulo, Brazil.

All patients were paraplegic. Two had spinal cord neo-
plasms and 18 had traumatic medullary injuries. The treatment of choice in all cases was the V-Y tensor fascia lata flap, either with or without muscle flaps.

Patients were positioned in lateral decubitus with legs bent over the abdomen at a 90° angle. Polyvinylpyrrolidone iodine solution was used for antisepsis. Ulcers were infiltrated with a 1:200,000 adrenaline solution and outlined with methylene blue to facilitate resection, which, whenever possible, was accomplished all at once (4), including the greater trochanter (5).

The V-Y tensor fascia lata flap was outlined as proposed by Paletta et al (6), with the anterior border of the V by a line parallel to the anterolateral compartment of the thigh and superiorly limited by the anterior superior iliac spine. The posterior margin corresponded to the posterior border of the ulcer; the vertex of the V was about 8 cm distal to the femur’s lateral condyle.

Dissection of the flap was initiated distally by an incision at the vertex of the V down to the fascia of the flap (7) – the latter was sutured with 3-0 cotton to the dermis to prevent sliding. The division of the tensor fascia lata from the vastus lateralis muscle was accomplished easily: superiorly, the tensor was separated from the gluteus medius (8), and anteriorly, dissection of the vascular pedicle was achieved. At this point, it was important to identify the muscle belly of the rectus femoralis (9) because this facilitates dissection of the lateral circumflex femoral artery.

In two cases, the tensor fascia lata muscle was inadequate for filling in the dead space. This led us to associate muscle flaps of rectus femoralis (10), which were anchored in the cavity with 2-O nylon bolster sutures.

The tensor fascia lata flap was rotated posteriorly and superiorly in the V-Y to cover the trochanteric ulcer. The most proximal part of the flap corresponded to the muscle portion of the tensor fascia lata. This portion was meticulously sutured in the previously debrided trochanteric area. Stay sutures were taken to ensure tension-free closure. Continuous suction drains were placed in all cases. The lateral portion of the thigh was undermined and sutured.

The drains remained for five to seven days. Sutures were removed on the 15th postoperative day, and the patient was allowed to lie down on the flap only after 30 days following suture removal.

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### TABLE 1: Comparison of the various methods of treatment for trochanteric ulcers

<table>
<thead>
<tr>
<th>Flap</th>
<th>Reutilization</th>
<th>Primary closure</th>
<th>Muscular mass</th>
<th>Coverage assurance</th>
<th>Scarring at pressure site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vastus lateralis</td>
<td>No</td>
<td>Yes</td>
<td>Large</td>
<td>More</td>
<td>+++</td>
</tr>
<tr>
<td>Rectus femoralis</td>
<td>No</td>
<td>Yes</td>
<td>Small</td>
<td>Less</td>
<td>+++</td>
</tr>
<tr>
<td>Gluteus maximus</td>
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<td>Yes</td>
<td>Small</td>
<td>More</td>
<td>++</td>
</tr>
<tr>
<td>Gluteus femoralis</td>
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<td>Possible</td>
<td>Small</td>
<td>Less</td>
<td>++</td>
</tr>
<tr>
<td>Classic tensor fascia lata</td>
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<td>Small</td>
<td>More</td>
<td>+++</td>
</tr>
<tr>
<td>V-Y tensor fascia lata</td>
<td>Yes</td>
<td>Yes</td>
<td>Large</td>
<td>More</td>
<td>++</td>
</tr>
</tbody>
</table>

++ Good situation of the scar in the site of a pressure ulcer; +++ Regular situation of the scar in the site of a pressure ulcer

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**RESULTS**

In all 20 cases the V-Y tensor fascia lata flap provided excellent coverage at the ulcer site (Figures 1-3). Postoperative follow-up ranged from six to 30 months; in no case was a skin graft necessary at the level of the V.

Four complications were reported. Partial necrosis at the extremity of the V-Y was observed as an early complication. This was corrected by debridement of the necrosis and underlining the anterolateral portion of the thigh.

Two postoperative seromas were drained by local aspiration. A late complication was the recurrence of osteomyelitis at the level of the greater trochanter, characterized as a small fistula at the posterior extremity of the V-Y.

**DISCUSSION**

There are several alternatives for trochanteric ulcer reconstruction, but it is of utmost importance that an appropriate surgical technique be adopted so as not to injure vascular pedicles of other feasible flaps (11).

The use of the tensor fascia lata flap in its posterior transposition was acclaimed by Nahai et al (3) in 1978. However, healing of flaps larger than 10 cm by primary intention is difficult. This implies an eventual graft placement at the donor site. Some disadvantages of employing the tensor fascia lata flap as proposed initially are as follows: First, the 180° flap rotation results in a voluminous appendix (dog ear) (3) in the proximal portion of the flap. This can interfere in the use of orthopedic appliances or make it difficult to get into a wheelchair (12). Next, the distal portion of the flap covers the trochanteric ulcer – not the proximal portion, which is its muscular portion. Third, skin graft donor sites in paraplegics are more difficult to heal, sometimes resulting in secondary raw regions (13).

The vastus lateralis for the treatment of trochanteric ulcers, proposed by Bovet et al (14) as a myocutaneous or muscle flap should be carefully analyzed, for its use may result in exposure of the femur’s diaphysis.

The gluteus maximus flap with inferior pedicle, and the glutal thigh flap as proposed by Hurwitz et al (15), make use of the posterior region of the thigh impractical. It is necessary to preserve them for ischiatic ulcer treatment.

Some authors propose the use of the rectus femoralis flap for the trochanteric ulcer. Nevertheless, it must be empha-
Figure 1) V-Y flap coverage performed on paraplegic patients with trochanteric pressure sores. Top left: Outlining the flap; Top centre: Postdebridement; Top right: Flap elevation; Middle left: Dissection of the vascular pedicle; Middle centre: Association with a muscle flap; Middle right: Immediate postoperative view; Bottom left: Immediate postoperative view; Bottom centre: One month postoperation; Bottom right: Detail at one month postoperation.

Figure 2) V-Y flap coverage performed on paraplegic patients with trochanteric pressure sores. Top left: Outlining the flap; Top centre: Postdebridement; Top right: Flap elevation; Bottom left: Dissection of the vascular pedicle; Bottom centre: Posterior transposition; Bottom right: Immediate postoperative view.
sized that many patients have flaccid paralysis and, therefore, have a very atrophied muscle.

The V-Y tensor fascia lata flap allows a coverage similar to the classical one, although it is the superior and muscular portion that fill the trochanteric region (16), providing better protection. Furthermore, in cases of osteomyelitis, it is known that the muscle flap will provide better evolution of local infection.

The recurrence of pressure sores is frequent, and the design of the V-Y tensor fascia lata flap permits its reutilization.

In all patients, closure was possible at the first intervention, which may not occur in the future. In such a case, the necessary skin graft will be similar.

This research enabled us to observe the advantages of the V-Y tensor fascia lata flap compared with other flaps (Table 1).

**CONCLUSIONS**

Sensate flaps will be the permanent solution for pressure sores. Currently, palliative solutions are recommended to patients, therefore, modifications that lessen complications are an important evolution in treatment.

The V-Y tensor fascia lata flap should be the treatment of choice for trochanteric ulcers because: reutilization is possible; healing by first intention is facilitated; and the superior and muscular portion fills the area, thereby providing better protection to it.

**REFERENCES**