A bipedicle flap in the correction of burn contractures

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Summary—The principle of the bipedicle flap has been employed in the correction of contractures using some of the skin and scar at the site of the contracture. The contracture is released by making two parallel transverse incisions one above and the other below outlining a bipedicle flap at the level of the joint crease. The scar above and below this transverse pedicle is excised to release the contracture and the raw areas are skin grafted. This manoeuvre combines the advantages of a flap (in the critical area) with those of skin grafting. With proper care and planning the “flap” invariably survives. It has been employed in the release of 38 contractures of various joints.

This paper describes the design of a bipedicle flap using the skin and scar of the contracture itself in the correction of contractures.

The procedure combines the benefits of a flap with those of a split-skin graft. It places a flap at the most critical part of the contracture and uses split-skin grafts at the less critical sites.

It markedly decreases the tendency to post-operative recurrence of the contracture and thus obviates the need for prolonged post-operative splintage of large joints in both children and adults and also in the small joints of adults. In children, the smaller joints may need minimal post-operative splintage.

The functional results are impressive and the cosmetic results are satisfactory. The appearance of the flap improves with the passage of time and hypertrophic scars tend to settle down with the release of tension and with pressure. However, if there is marked puckering and pocketing in the area of contracture, a revision of the scar may be necessary later.

It is imperative that the flap is not undermined, as this may interfere with its blood supply. Hence careful planning is necessary, so that the flap lies in the ideal position after correction of the contracture.

It is obviously a great advantage to be able to use some of the existing scar and skin, particularly in...
those cases where there is no adjacent healthy skin to rotate or transpose into the defect created after release of the contracture.

Occasionally, if a contracture produces a very long web as may happen in the axilla, the bipedicle flap will hang down like a necklace. It will then need resection of its central portion and conversion into two flaps. The only disadvantage of the technique appears to be need to apply split-skin grafts to two separate areas.

Materials and methods
This paper is based on personal experience of 38 contractures in 32 patients. In every case the contractures were the result of burns. The sex incidence was equal: 16 male and 16 female. The ages ranged from 1-40 years and included nine patients aged 1-10 years, ten patients aged 11-20 years and 13 patients aged 21-40. The anatomical sites of the contractures are indicated in the Table.

<table>
<thead>
<tr>
<th>Anatomical site</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axilla</td>
<td>2</td>
</tr>
<tr>
<td>Elbow</td>
<td>8</td>
</tr>
<tr>
<td>Wrist</td>
<td>1</td>
</tr>
<tr>
<td>Fingers</td>
<td>4</td>
</tr>
<tr>
<td>Knee</td>
<td>17</td>
</tr>
<tr>
<td>Ankle</td>
<td>2</td>
</tr>
<tr>
<td>Neck</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

Technique
The joint line was marked by a continuous line from the medial to the lateral side. Then dotted lines were drawn one above and another below the joint line each extending to the lateral plane on either side (Fig. 1). The distance between the dotted lines was such that a flap of adequate width...
Figure 9—Contracture of axilla—pre-operative view. Figure 10—Post-operative view two months later.

Figure 11—Contracture both knees—pre-operative view. Figure 12—Early post-operative result.
covered the joint. It is essential to mark the joint line accurately and plan the flap carefully. Two transverse incisions are made along the dotted lines. The contracture is corrected through these two transverse incisions. If the flap is accurately planned, it will remain at the level of the joint line after correction of the contracture (Fig. 2). If the planning is not accurate, the flap will become displaced above or below the joint level after correction of the contracture. The flap will then need to be undermined and moved to the joint line, a manoeuvre that may devitalise the flap. An adequate correction of the contracture is possible through the two transverse incisions that have been described and the raw surfaces are covered with split-skin grafts (Figs. 3, 4, 5). However, full-thickness grafts were used on the fingers of children.

The advantages of this technique in countries where post-burn contractures of extreme severity are encountered in large numbers are obvious. Some representative cases are presented (Figs. 6-12).

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