

RECONSTRUCTION OF ILIAC CREST DEFECTS USING A RIB GRAFT

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In 22 cases of anterior surgery of the spine an iliac crest graft was used to fill in the spaces created by multiple discectomies in Scheuermann's disease or the defect created in the anterior spine in a variety of different etiologies.

The iliac crest graft was used for this purpose in stead of ribbone because it has mechanical advantages and promotes faster and better bone healing compared to ribbone.

The resected rib, harvested during the anterior approach to the spine was used to bridge the defect in the iliac crest. This procedure gave consistently good results with little or no pain experience at follow-up.

Some irregularity may persist after this procedure, but this radiological finding does not pose a problem in clinical practice.

Iliac crest bone is often used during anterior spinal surgery to achieve correction and fusion. Mostly a full-thickness graft from the anterior iliac crest is used. If large segments of bone arc removed, ugly defects may result, especially in thin people. Apart from the cosmetic problem the defect may be painful, and even herniation of abdominal contents has been reported(1).

In order to avoid these phroblems in twenty-two patients the iliac crest defect was filled with a rib graft at the end of the spinal surgery. The rib graft was harvested during the spinal approach. Hardy (2) in 1977 described this method in eight patients with good results. Lubicky and Dewald (3) advocated filling the defect with bone cement and obtained a good result in eight patients. Long-term follow-up however was not performed and the question arises wether the presence of methyl methacrylate in the pelvis in relatively young patients may not create problems in later life. After union of a rib graft later problems are not to be expected.

METHOD

Hardy's technique was somewhat modified in order to re-establish a better contour of the iliac crest. The rib graft was therefore pointed on both sides so that after insertion the upper border of the rib graft would be in line with the iliac crest. This was not succcsfull in every case; often a small step remained at the crest-rib junction. mWith a curct or other sharp instrument a hole is made in both edges of the crest and after inserting the graft on side the other side is hammered into place (fig. 1).

Usually the graft is locked in the crest surprisingly firmly. It is important to cover the graft well with the previously detached muscles and pericostal insertions. A drainage tube is always left in place.

MATERIAL

Twenty-two patients underwent a corrective procedure of the spine with use of iliac crest bone with simultaneous reconstruction of the iliac crest with rib bone collected in the course of the thoracotomy of thoraco-phrcno-lumbotmy approach. In ten cases the surgical procedure was the first step in Scheuermann's kyphosis correction. At six or seven levels iliac crest bone blocks were inserted in the spread and cleared disc spaces in order to obtain preliminary correction and to serve as hinges during posterior correction at a second stage (4,6)/ Anterior fusion induced by iliac crest bone seems to be better and faster than with (non-vascularized) rib bone. The iliac bone blocks probably retain better bony contact with the vertebrae after the posterior corrective procedure than rib bone (6). The large defect of the iliac crest after removing six or seven bone blocks could be bridged adequately with a well-tailored rib graft.

In nine patients vertebral fractures, four of them fresh and five of long standing were treated with anterior correction and fusion, in four patients with spinal cord decompression. The iliac crest graft was put under compression by Zielke-Slot screws and rod. The iliac crest defects in these cases were smaller and could easily be bridged. However, in one instance the graft was taken from too far forward and a fracture of the anterior superior iliac spine resulted, as described by Realc (5), with a rather loose fitting of the rib graft. Despite this insecure fixation the graft consolidated in approximately four months (fig.2). In three other cases iliac crest grafts were used: once to fill a tuberculous defect of

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the upper thoracic spine after debridement and twice in patients with Bechterew's disease, once with a pscudarthrosis after correction of a thoracolumbar kyphosis and who was treated with an intercorporeal fusion, and once in a patient with a spondylodiscitis.

No infections, postoperative haematoma's or nerve palsies (7) occurred in this series. The postoperative plastercast used in almost every case caused a problem in only one patient, necessitating freeing of the anterior iliac crest.

RESULTS

In all cases solid fusion was obtained. At follow-up 6-45 months (mean 28 months) postoperatively none of the patients had serious complaints about the operated iliac crest. Mild intermittent pain was present in three patients. This required the sporadic use of analgetics in only one patient. In four patients tenderness was experienced on palpation (table 1). Roentgenologically (in the first ten patients) a bony spur existed on the anterior side of the fused rib graft in four patients, including two of the four patients with slight tenderness (fig.3). Thinning of the graft was seen in two patients and a depression of the crest in spite of the reconstruction was present in three patients. Some of these features were combined in a few patients (table 2). In most patients the crest was not painful and felt quite regular, though a little thinned. (fig.4).

DISCUSSION

In thoracic and thoracolumbar anterior surgery of the spine a rib is frequently removed which can serve as graft material in the fusion procedure. Iliac crest bone, however, has several advantages. It is more stable mechanically, gives better correction, is easier

to handle and seems to give faster union. To overcome most of the problems that may occur if large defects are created in the iliac crest the rib taken out during the spinal exposure was used to fill the defect. The contour of the rib is almost the same as that of the iliac crest and the rib is easily fitted in. In twenty*one out of twenty-two cases immediate stability was obtained and at follow-up slight spontaneous pain was present only occasionally in three patients. No cosmetic problems occurred. This procedure seems more logical than filling the defect with methylmethacrylate, provided that a rib graft is available. Whether bankbone rib grafts can be used for the same purpose and with the same results is not known and may be a subject of further study.

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