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Sacroiliac Joint Arthrodesis for Chronic Lower Back Pain

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Summary. We report our experience with sacroiliac joint arthrodesis in cases of overt osteoarthritis. Twenty-two operations were performed over a period of 3.5 years and reviewed between 12 and 55 months postoperatively. The clinical picture and diagnostic steps are discussed. We conclude that if the selection of patients is strict we can expect 70% satisfactory results.

Based on the latest anatomical [1, 7], biomechanical [4, 5, 10–13], and pathological [1] studies we have described [8] the clinical sequence of the degenerative disease of the sacroiliac joint and proposed a therapeutic approach.

Two phases of the same disease were recognized:
1. The early phase of pelvic instability
2. The late phase of overt ostheoarthritis

In this report we deal with the surgical treatment of the late phase.

Selection of Patients and Methods

Diagnosis

Clinical Picture. Pain is the main symptom. It is localized in the sacroiliac area and the lower back, with varying irradiation to the groin, outer side or sometimes anterior aspect of the thigh down to the knee. It has a stabbing, tearing, or cutting character. It is almost constantly present, including night and rest pain. It is enhanced by long periods of sitting or by upright positions.

On physical examination there is local tenderness in the joint area and the Patrick and Gaenslen tests are positive.

Roentgenological Signs. On plain radiographs and CA tomographs a smaller joint space with irregular surfaces is found. The subchondral bone at the sacral side is sclerotic and cysts appear on both sides of the joint. Caudal osteophytes are occasionally found.

Scintigraphy. There is a clearly enhanced uptake of technetium diphosphonate on the affected side.

Diagnostic Tests. With the patient prone and under television control the dorsocaudal area of the joint is punctured. A 10% NaCl solution (1–2 ml) is then injected. To be positive the provocation test has to reproduce exactly the pain pattern the patient complains of.

A further injection of 1–2 ml of a local anesthetic solution relieves the pain completely for the duration of the drug's effect.

Psychological Evaluation. To rule out psychosomatic disturbances we used three tests in the German language and an anamnestic interview. The three tests were:
1. FAPK (Questionaire for the recognition of psychosomatic diseases)
2. MMPI (Minnesota multiphasic psychological inventory)
3. FPI (Freiburg personality inventory)

For a patient to be operated upon the clinical picture, radiology, scintigraphy, and diagnostic tests all had to be positive. From 1984 onward, psychological disturbances were looked upon as a contraindication for surgical intervention.

Operative Technique

The joint is exposed through a dorsally located arched incision. The articular surfaces are completely excised (under television control) and a corticocancellous bone graft taken from the iliac crest and/or tricalciumphosphate ceramic blocks are then interposed under pressure between the denuded cancellous bone. Motion is permited in bed, and on the 10 postoperative day a short-leg spica cast is applied. This is worn for 8 weeks.

Patients

Twenty-two operations were performed on 21 patients from August 1981 through March 1985. There were 18 women and three men. The ages ranged between 20 and 58, with a mean of 42 years.

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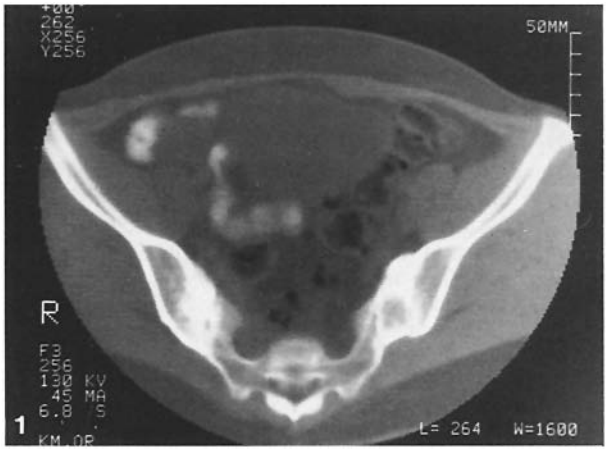

Fig. 1. Bilateral arthrodesis 18 and 30 months postoperatively

Fig. 2. Nonunion on the right side 20 months postoperatively

Follow-up ranged between 12 and 55 months, with a mean of 30. Duration of symptoms prior to operation was longer than 2 years. Nine patients had undergone previous operations for their complaints. A diskectomy had been performed in two patients, posterolateral spinal fusion in five, and a bilateral total hip replacement in two. A further two patients started their pain history following a Chiari pelvic osteotomy.

Up to 1984, seven patients with definite psychosomatic disturbances were nevertheless operated on when all other criteria were filled.

Results

For practical reasons and for the sake of objectivity we instituted only two classifications: satisfactory and unsatisfactory results. To be included in the satisfactory-result group, a patients pain had to be reduced by at least 50%, there had to be no need for the use of analgetics, and the preoperative occupation had to be resumed. On the whole we had 11 satisfactory cases. All these showed a fully united joint space after 12 months (Fig. 1).

Among the 11 unsatisfactory results there were two nonunions (Fig. 2) and one infection. Six further patients fulfilled all the criteria for a psychosomatic disease and were all operated on before 1984. Only one patient with psychological disturbances eventually became pain free, following treatment in a psychosomatic clinic.

Of the five patients who had previously undergone spinal fusion, three were pain free, one was not improved, and one contracted an infection.

Of the two patients who had had hip replacements one was pain free for 1 year, after which the symptoms recurred, whereas the other is still pain free 16 months following surgery. The two patients whose symptoms began following Chiari osteotomies have clearly improved after the arthrodesis and have resumed active lives.

Both patients with prior diskectomies were failures. One of them developed a clear nonunion and the other corresponded to the psychosomatic group.

Discussion and Conclusions

Campbell [2, 3] and Smith-Petersen and Rogers [6] described the good results of this operation in the late 1920s. Following the description of nucleus pulposus protrusion, however, the sacroiliac joint was almost forgotten as a source of back pain. From our own experience, very similar to that reported by Walheim [9], it becomes clear that, provided we select our cases carefully and exclude the psychosomatic patients, 70% satisfactory results can be expected.

Selection has to be very strict and no shortcuts should be allowed. All positive criteria have to be fulfilled, namely:

1. Constant lower back pain of long duration
2. Pain irradiation into the groin and/or thigh without radicular distribution
3. Positive radiological findings, preferably on a CAT scan
4. Enhanced uptake in bone scintigraphy
5. Positive pain-provocation test
6. Relief of pain following controlled infiltration
7. No psychosomatic disorder.

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