

Poly lactide screws in acetabular osteotomy

28 dysplastic hips followed for 1 year

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Absorbable poly lactide screws were used for internal fixation of rotational acetabular osteotomy (RAO) in 28 dysplastic hips. No cast was used and the patients were allowed to walk with partial weight bearing 1 month after surgery. Clinical and radiographic results were evaluated after 14 (6–24) months. Union occurred in all cases within 4 months

without displacement of the osteotomy. No foreign-body inflammatory reaction on radiographs was observed, nor were there any local reactions, such as redness or swelling. Poly lactide screws seem to provide sufficient strength for the internal fixation of RAO. Further observation is necessary to identify any late foreign body reaction.

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Rotational acetabular osteotomy (RAO) is a circum-acetabular en block osteotomy for the dysplastic hip (Ninomiya and Tagawa 1984). To transfix the acetabulum to the grafted bone and the pelvis, one can use 2 Kirschner wires. However, the wires may hinder post-operative hip flexion, the distal ends of the wires may irritate the skin or the lateral femoral cutaneous nerve, and minor surgery is necessary for their removal.

We report on the use of absorbable ultra-high molecular weight poly lactide screws in RAO.

Patients and methods

28 consecutive cases (28 hips) of acetabular dysplasia, some of which showed degenerative changes, entered the study. There were 2 men and 26 women, with a mean age of 34 (15–55) years. The mean postoperative follow-up period was 14 (6–24) months.

The surgical procedure was not changed from a previous report (Ninomiya and Tagawa 1984), except for the internal fixation materials; absorbable screws were used to transfix the acetabulum to the grafted bone and the pelvis (Figure 1). We used 68 screws in 28 patients; 2 screws in 17 patients, 3 screws in 10 patients and 4 screws in 1 patient.

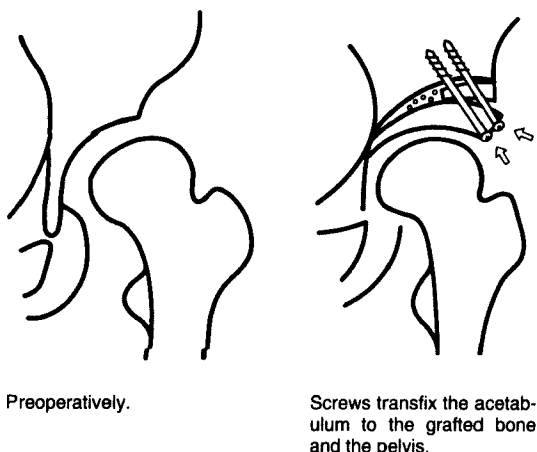
The screws were manufactured specially for research purposes and made of ultra-high molecular weight poly lactide (Johnson & Johnson Orthopaedics). The screws measured 4.5 mm in outer diameter, 3.4

mm in core diameter, 1.75 mm in thread pitch and 40–60 mm in length.

A 3.5-mm drill bit was used and the entire length of the anticipated screw to be used was tapped using a 4.5-mm tap. The screws were then inserted using a torque screwdriver to prevent inadvertent breakage of the screw during insertion.

No cast was used after surgery. The patients used wheel chairs for 4 weeks, walked with partial weight bearing in the fourth or fifth week, and walked with full weight bearing in the fifth month.

Figure 1. Location of the poly lactide screws.



Preoperatively.

Screws transfix the acetabulum to the grafted bone and the pelvis.

Figure 2. Rotational acetabular osteotomy in a 19-year-old woman.



Preoperatively



After 1 month.



After 4 months. Bone union without displacement of the osteotomized acetabulum.

Bone union was evaluated using antero-posterior (AP) radiographs. The range of flexion and abduction of the hip joint was measured 3 months postoperatively and compared with preoperative values. Any reaction to foreign material was evaluated on AP radiographs and local findings.

Results

Bone union occurred in all cases within 4 months without displacement of the osteotomized acetabulum (Figure 2). The mean range of hip flexion 3 months after operation was 112 (90-135) degrees, and the mean range of abduction was 25 (10-35) degrees. These mean values were about 90 percent of the preoperative values.

In all cases, apart from the radiolucent area of the screws per se, there were no abnormal findings, such as osteolytic reaction or bone atrophy. No local reactions, such as redness or swelling, were observed around the hip joint, and removal of the screws was not necessary.

Discussion

Our study shows that the ultra-high molecular weight polylactide screws have sufficient fixation strength to be used as internal fixation materials in RAO. The use of absorbable screws instead of Kirschner wires in this

procedure seems beneficial in postoperative rehabilitation and makes a second operation for removal unnecessary.

Reaction to foreign materials, which is reported as a complication of absorbable polyglycolide implants (Böstman 1991), did not occur with the polylactide screws used in this study. However, considering the fact that the degradation of polylactide implants occurs slowly (Cutright and Hunsuck 1972), further observation is necessary to identify any late reaction to foreign materials.

References

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