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Rotational acetabular osteotomy using biodegradable internal fixation

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Abstract We used biodegradable poly-L-lactide screws in rotational acetabular osteotomy in 41 hips of 41 patients, and studied the complications after an average follow-up of 4.9 years (range 1.0–7.7 years). There were 39 females and 2 males, their average age at the time of the operation was 32 years (range 12–55 years). A small subcutaneous abscess appeared around the non-absorbable sutures in 2 patients after surgery. There was 1 case of thrombophlebitis and 1 of local dermatitis. The small subcutaneous abscess resolved after the removal of the suture material in the 2 cases, and the thrombophlebitis resolved with aspirin. The local dermatitis persisted but was cured by local steroid therapy over 5.8 years. The incidence of local dermatitis after the use of biodegradable implants should be further investigated.

Résumé Nous avons utilisé des vis biodégradables en poly L lactide pour les ostéotomies acétabulaires rotatoires des 41 hanches de 41 patients et nous avons étudié les complications possibles sur un suivi moyen de 4.9 ans (de 1 à 7.7 ans). L'échantillon comportait 39 femmes et 2 hommes. L'âge moyen au moment de l'opération était de 32 ans (12 à 55 ans). Nous avons noté 2 cas de complication post-opératoire sous la forme d'un petit abcès sous-cutané autour des sutures irrésorbables, 1 cas de thrombophlébite et 1 cas d'eczéma local. Le petit abcès sous-cutané s'est résorbé après enlèvement du matériau de suture dans les 2 cas, la thrombophlébite a été traitée l'aspirine et l'eczéma local a été soigné par une

thérapie locale aux stéroïdes en 5.8 ans. La fréquence des dermatites locales après l'utilisation des implants biodégradables devrait être étudiée sur un plus grand nombre de cas.

Introduction

We have previously described our use of biodegradable poly-L-lactide screws in rotational acetabular osteotomy in 28 cases [2]. After a minimum follow-up of 6 months, bone union occurred uneventfully in all cases, and no local reactions were observed. We have now followed 41 cases, including the original 28, for an average of 4.9 years, and have encountered late dermal complications and some technical problems.

Patients and methods

Between May 1990 and November 1991, we used poly-L-lactide screws (Johnson & Johnson Orthopaedics, USA) for rotational acetabular osteotomy on 41 hips in 41 patients at the University of Tokyo Hospital or at the University of Tokyo Hospital Branch. There were 39 females and 2 males; the mean age at operation was 32 years (12 to 55 years). We have personally followed up 39 of these patients clinically and radiographically, while the other 2 were reviewed in part through questionnaires. The average period of follow up was 4.9 years (range 1.0–7.7 years).

The surgical procedure has been previously reported [2, 3]. In one extremely dysplastic hip, a block of hydroxyapatite was used in addition to an autogenous bone graft to fill the gap. In 38 of the 41 hips, rigid fixation was achieved with two to four poly-L-lactide screws only and no additional fixation was used. In the hip in which a block of hydroxyapatite was used, one poly-L-lactide was used to transfix the acetabular fragment and the grafted bone to the pelvis, and two Kirschner wires were used to stabilise the acetabular fragment and the block of hydroxyapatite. In the remaining two hips, we could not gain rigid fixation with only 2 or 3 poly-L-lactide screws, and added one Kirschner wire in each case. We closely examined the postoperative course of each case for the development of any complications.

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Results

There were four postoperative complications. A small subcutaneous abscess occurred around the non-absorbable sutures in 2 hips within 1 year after operation that healed after removal of the suture material. Another hip had developed mild thrombophlebitis in the lower leg of the operated side, which healed with aspirin. A 55-year-old female patient developed itching local dermatitis of unknown origin, 3 cm in diameter, on the skin incision, 8 months after surgery. We performed a patch test on the skin using poly-L-lactide materials in order to determine a possible allergic reaction to poly-L-lactide. The result of the patch test was negative for each of the following materials: lactide, low-molecular weight poly-L-lactide and extract of poly-L-lactide.

We could not determine a definite cause. The dermatitis was improved gradually by steroid ointment, and was finally healed by 5.8 years after surgery. The clinical outcome of this patient was very good, and the radiograph at 5.8 years after surgery showed no progression in the osteoarthritis compared to before the operation.

Discussion

Various biodegradable materials for internal fixation are now available. Foreign body reactions to polyglycolide screws such as sinus formation, fluid drainage and oste-

olysis have been reported as a later inflammatory non-infectious tissue response to a large volume of polyglycolide [5]. Fridén and Rydholm [1] reported a case of severe synovial reaction to polyglycolide rods that had been used for fixation of osteochondritis dissecans of the knee. However, in reports on the clinical trials of poly-L-lactide implants [4, 6], no sinus formation and no fluid build-up have been reported. Our patient with local dermatitis is the first with such a reported complication from a poly-L-lactide implant.

References

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