



Case report

Iliopsoas impingement after revision total hip arthroplasty treated with iliopsoas muscle transection



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HIGHLIGHTS

- We reported a patient with iliopsoas tendinitis after revision THA.
- Two-level iliopsoas muscle transection was necessary.
- Open surgery should be considered in patients with pain after revision THA.

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ABSTRACT

Introduction: Iliopsoas tendinitis after revision total hip arthroplasty (THA) is rare and its etiology and optimal treatment are still unclear. We report a case of iliopsoas impingement after revision THA with a Kerboull acetabular reinforcement device requiring two-level iliopsoas muscle transection.

Presentation of case: A 70-year-old woman presented to our hospital complaining of debilitating right groin pain after revision THA with a Kerboull reinforcement device. She had undergone multiple hip operations after experiencing a pelvic fracture in a motor vehicle accident. A lidocaine nerve block at the level of the Kerboull device resulted in temporary but marked reduction in pain and a diagnosis of psoas impingement. We performed surgery via an anterior approach to release the iliopsoas muscle from the lesser trochanter. After iliopsoas tenotomy was performed, the muscle was still under high tension because of dense adhesions. Repeat transection of the iliopsoas muscle at the level of the anterior branch of the Kerboull device resulted in loosening of the iliopsoas muscle and resolution of impingement. Postoperatively, the patient's groin pain completely disappeared, and she can now walk with a single cane and is satisfied with her result.

Discussion: Adhesions around the iliopsoas muscle likely contributed to the patient's groin pain. Open surgery to perform complete release of iliopsoas muscle impingement should be considered in patients with pain after revision THA.

Conclusion: We reported a patient with iliopsoas tendinitis after revision THA requiring two-level iliopsoas muscle transection.

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1. Introduction

Iliopsoas tendinitis after total hip arthroplasty (THA) is caused by impingement of the iliopsoas tendon by various structures, such

as screws and the anterior margin of the acetabular component. The tendinitis is reported to arise from repeated contact and friction, and accounts for pain in 4.3% of patients after THA surgery [1]. Several reports have shown that tendinitis can be ameliorated through conservative therapy such as local anesthetic injection [2,3] or surgical treatment with endoscopic or open tenotomy of the iliopsoas muscle [4,5]. However, its pathology and ideal treatment, as well as its incidence after revision THA, are unknown [6]. We report of a case of iliopsoas impingement after revision THA

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with a Kerboull acetabular reinforcement ring requiring iliopsoas muscle transection at two levels. The patient agreed that the details of this case could be submitted for publication.

2. Case presentation

A 70-year-old woman presented to our hospital complaining of severe, debilitating right groin pain. She had experienced a pelvic fracture during a motor vehicle accident 24 years earlier and had undergone open reduction and internal fixation (operative details are unknown). One year after the accident, the patient experienced the onset of post-traumatic arthritis of the hip, and THA was performed via a posterolateral approach, using a Stryker Super Secur-Fit uncemented femoral component with a Trident® AD Acetabular System (Stryker Orthopedics, Mahwah, NJ, USA). Eleven years after the primary THA, the patient underwent a revision THA using a posterolateral approach because of aseptic loosening of the acetabular component. Nine years after the revision THA, re-revision THA was performed using a Kerboull reinforcement device via lateral approach, again because of aseptic loosening of the acetabular component. After this re-revision THA, the patient developed right groin pain postoperatively. On physical examination, passive range of motion in the right hip revealed flexion of 80°, extension of 0°, and external rotation of 20°. Pain prevented the assessment of internal rotation. The groin pain was elicited during

flexion and internal rotation, as well as during extension and internal rotation, and the patient's right hip was permanently externally rotated. Manual muscle testing (MMT) yielded a score of 3 for hip joint flexion, which was decreased because of frequent surgery, and a score of 5 for extension. It was not possible to assess abduction because the hip could not be maintained in neutral position.

X-ray of lateral view revealed a prominence of the anterior flange of the Kerboull reinforcement device (Fig. 1A, B). Computed tomography (CT) scan also detected a similar prominence (Fig. 1C). We performed a lidocaine nerve block at that level under fluoroscopic guidance, and because the pain was temporarily markedly reduced, we made a diagnosis of iliopsoas impingement consistent with the clinical symptoms (Fig. 2).

We opted to perform surgery via an anterior approach to transect the iliopsoas muscle. The iliopsoas tendon ran immediately above the anterior branch of the Kerboull reinforcement device through the joint capsule (Fig. 3A). After tenotomy of the iliopsoas muscle at the lesser trochanter, tension on the iliopsoas muscle was still high, and the impingement of the iliopsoas muscle by the anterior branch of the Kerboull reinforcement device continued because of dense adhesions around the iliopsoas muscle. Therefore, the iliopsoas muscle was re-cut at the level of the anterior branch of the Kerboull device (Fig. 3B). This cut resulted in loosening of the iliopsoas muscle and elimination of the impingement.

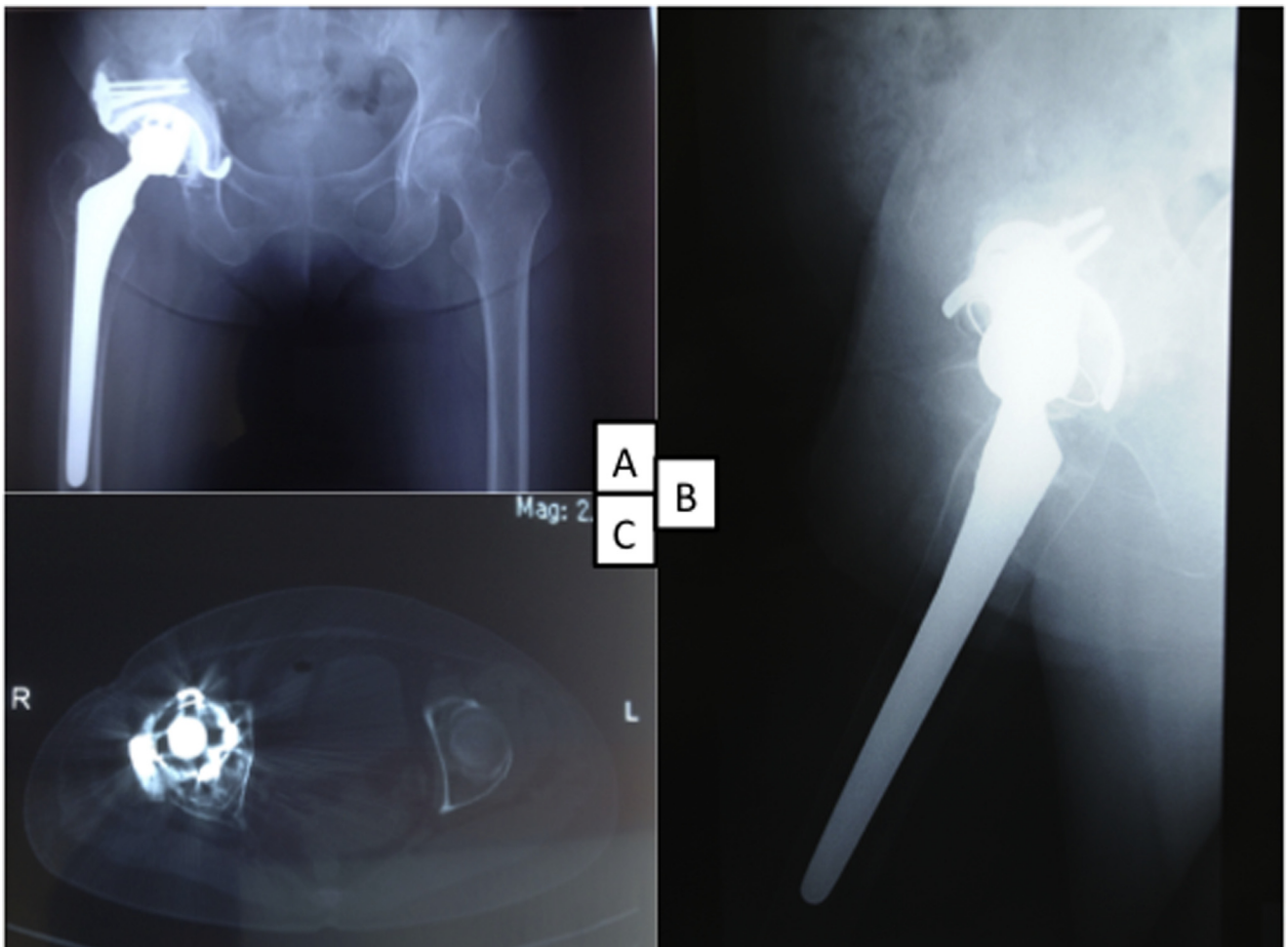


Fig. 1. A, B) A plan X-ray image reveals a prominence of the anterior branch of Kerboull reinforcement device. C) CT axial image shows a similar prominence of the Kerboull reinforcement device. CT, computed tomography.



Fig. 2. Lidocaine nerve block at the level of Kerboull reinforcement device under fluoroscopic guidance resulted in temporary but markedly reduced pain.

Post-operatively, the patient's groin pain disappeared completely. Active hip internal rotation was possible immediately after surgery. Although flexion muscle strength decreased to a score of 2 on MMT immediately after surgery, 12 months after surgery it had recovered to a score of 3. The patient is able to walk with a single cane and is satisfied with her results.

3. Discussion

Although THA provides excellent pain relief and functional recovery, a small number of patients complain of persistent pain after primary THA [7,8]. Iliopsoas impingement after primary THA is considered one cause of such pain, but the exact etiology, the optimal treatment, and the incidence of such pain following revision THA have not been clarified. In this paper, we demonstrated that impingement and adhesion can cause persistent pain after revision THA. This required treatment with tenotomy as well as transection of the iliopsoas muscle. Because adhesions around the iliopsoas muscle from previous surgery can contribute to the mechanism of impingement and consequent anterior groin pain, we believe open surgery to perform complete release of the

iliopsoas muscle should be considered in cases of operation for iliopsoas impingement release after revision THA.

Post-THA iliopsoas impingement was first reported by Lequesne et al., in 1991 [9]. It is believed to be caused by contact or friction between the iliopsoas tendon and the acetabular component, which is the mechanical stimulation that triggers pain onset. Such stimulation can occur with both cemented and uncemented cups, but can be caused by the outflow of cement, anterior projection of the flange cup when cement is used, or by projection of the cup or a screw from the anterior acetabular margin when cementless techniques are used [9]. Kerboull reinforcement device is widely used for hip surgery in world with excellent results [10,11]. To the best of our knowledge, no report has been published concerning about the iliopsoas impingement after revision surgery with an acetabular reinforcement device. Our case demonstrated a possibility of the incidence of iliopsoas impingement with those acetabular reinforcement devices.

Diagnosis is commonly made by testing with an anesthetic block, or using clinical symptoms such as pain during flexion and internal rotation or during deep flexion. In the present case, because the plate used was somewhat anterior, a part of the anterior flange was believed to cause impingement of the iliopsoas muscle, and a lidocaine nerve block was positive. When there is no improvement after conservative therapy, surgical treatment should be considered.

Several options have been proposed for operative treatment, such as reimplantation or endoscopic or open tenotomy of the iliopsoas muscle [1–5]. Reimplantation may be an option, especially in cases of confirmed malpositioning or contact with the materials. However, complications of the procedure itself should be thoroughly discussed. Dora et al. performed reimplantation in 16 patients with anterior impingement after primary THA [12]. In their report, although the pain improved, complications were common [12]. In our case, reimplantation was not selected because we thought that risks such as infection, additional bone loss, and further soft tissue damage would outweigh the benefits. For this reason, tenotomy was selected even though functional loss due to iliopsoas muscle tenotomy was possible.

The adverse effects of iliopsoas tenotomy are unclear. It is generally thought that there is no significant loss of hip flexion strength after tenotomy [13]. Dora et al. mentioned that none of the six patients in their study complained of weakness with flexion or when getting in or out of a car after iliopsoas tenotomy, although

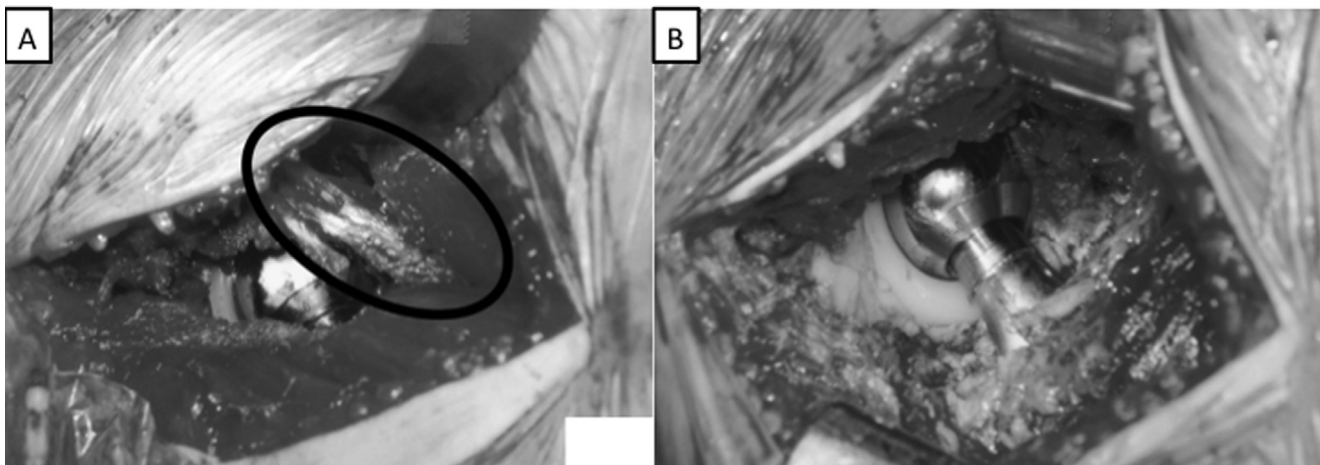


Fig. 3. A) Iliopsoas tendon runs immediately above the anterior branch of the Kerboull reinforcement device through a joint capsule with marked adhesions. B) The iliopsoas muscle is transected at the level of the anterior branch of the Kerboull reinforcement device. After this cut, the iliopsoas muscle was loosened and no impingement was observed.

the small number of patients made it difficult to reach a definite conclusion [12]. However, if—as in our case—transection of the iliopsoas is necessary because of adhesions, active hip flexion might be sacrificed.

Endoscopic tenotomy of the iliopsoas muscle has gained popularity in recent years because of its minimally invasive nature [13]. Gédouin et al. reported a case series of endoscopic tenotomy performed in 10 hips with no intra- or postoperative complications [13]. However, unexpected adhesions from previous surgery could make a minimally invasive procedure difficult.

4. Conclusion

We have reported a case of iliopsoas impingement after revision THA with a Kerboull reinforcement ring. Adhesions around the iliopsoas muscle likely contributed to the mechanism of the patient's anterior groin pain. We believe that open surgery to perform complete release of iliopsoas muscle impingement should be considered for these patients.

Ethical approval

This case report is written based on institutional ethical committee.

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Author contribution

All authors have contributed significantly, and that all authors are in agreement with the content of the manuscript.

Itaru Morohashi and Yasuhiro Homma wrote the paper. Itaru Morohashi operated the patient. Yasuhiro Yamamoto, Hiroyuki Obata, Atsuhiko Mogami and Akio Kanda assisted the surgery. Osamu Obayashi, Kaneko Kazuo and Yasuhiro Homma performed the manuscript editing.

Contribution

IM and YH wrote the paper. IM operated the patient. YY, HO, AM

and AK assisted the surgery. OO, KK and YH performed the manuscript editing.

Conflict of interest

The authors stated that they had no interests which might be perceived as posing a conflict or bias.

Guarantor

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