



Failure of Constrained Total Hip Arthroplasty with Intact Reinforcement Ring

Koruyucu Halkası Sağlamken Çıkık Gelişen Kısıtlayıcı Total Kalça Protezi Olgusu

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Abstract

One of the most common complications after total hip arthroplasty (THA) is dislocation. To avoid this unpleasant complication, we use constrained systems especially in patients at high risk of dislocation. We report two cases of failure of constrained hip system with intact reinforcement ring. We used Trilogy® revision cup in both patients. One of the patients refused surgery. Other patient underwent surgery and we observed abrasion of constrained liner because of impingement. Malrotation of the constrained liner appears to cause impingement. When using constrained liners, caution should be exercised against the risk of impingement. Proper assessment of the constrained liner is mandatory. Otherwise, abrasion of the liner is not a surprise. Instructions of the manufacturer should be followed. The fact that such a small misplacement has such great consequences can also be accepted as a disadvantage of the product. It may be difficult to determine the proper rotation of the polyethylene liner during surgery. Therefore, it would be appropriate to have a wider range of correct polyethylene placement angles.

Keywords: Hip, prosthesis, dislocation, constrained

Öz

Kalça çıkığı total kalça protezi (TKP) sonrası görülen en sık komplikasyonlardan biridir. Bu istenmeyen komplikasyonlarla karşılaşmamak için çıkık riskinin artmış olduğu hastalarda sıklıkla kısıtlayıcı sistemler kullanılmaktadır. Kısıtlayıcı sistem ile TKP yapılan ve sonrasında koruyucu halkası sağlam olduğu halde kalça çıkığı gelişen iki hasta olgu sunumu olarak paylaşıldı. Hastalardan bir tanesi revizyon ameliyatını kabul etmedi, diğeri ise kliniğimizde opere edildi. Opere edilen hastada kısıtlayıcı liner malrotasyonuna bağlı sıkışma ve liner aşınması gözlemlendi. Kısıtlayıcı linerin uygun yerleştirilmesi bu ameliyatlarda hayati öneme sahip, aksi takdirde liner aşınması ve kalça çıkığı ile karşılaşılabilir. İmplant üreticisinin yönergelerine uymak gereklidir. Ancak bu kadar küçük bir yerleştirme hatasının bu kadar büyük sonuçları olması implantın bir dezavantajı olarak görülebilir. Zira ameliyat sırasında uygun polietilen liner rotasyonunu belirlemek oldukça zor olabilir. Bu yüzden doğru yerleşim açısının daha geniş bir aralıkta olması uygun olacaktır.

Anahtar Sözcükler: Kalça, protez, çıkık, kısıtlayıcı

Introduction

One of the most common complications after total hip arthroplasty (THA) is dislocation. The dislocation rate after primary THA has been reported to be 1-7% (1,2). Dislocation after revision hip arthroplasty has been reported in up to 30% of patients (1-3). The constrained liners are indicated as a component of a total hip prosthesis in primary or revision THA for patients who are at high risk for hip dislocation and all other options have been considered. We report two cases of failure of

constrained hip system with intact reinforcement ring. We used Trilogy® cup (Zimmer, USA) in both patients. Dislocation rates with this type of acetabular component have been reported to be 9-33% in different series (4,5). Dislocation of constrained hip with intact reinforcement ring is a rare condition. A few published reports of this kind of dislocations exist but we were unable to find any other published reports about Trilogy® constrained cup failure with intact reinforcement ring.

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Case Reports

Case 1

A 72-year-old female patient underwent THA in 2010. One year later, she underwent two-stage revision surgery because of infection. In 2014, she presented to our clinic with infected total hip prosthesis and treated with two-stage revision surgery again. In late 2015 she was admitted with periprosthetic distal femur intraarticular fracture. She underwent total femur prosthesis and constrained hip arthroplasty. Five months later, she presented with dislocated hip with intact reinforcement ring (Figure 1).

At revision surgery, the retaining fingers of the polyethylene liner were found at the 2-8 o'clock position and the inferior finger was disrupted because of impingement of the femoral head (Figure 2). New constrained liner was adapted to 1-7 o'clock position which is suggested by the manufacturer.

Case 2

A 79-year-old female patient underwent THA in 2011. Two years later, the acetabular component was revised because of multiple dislocations. In 2015, she applied to our clinic because of hip dislocation with failure of constrained liners. The reinforcement ring was disrupted. Total revision surgery was performed with Trilogy® constrained acetabular liner (Zimmer, USA). Two months later, she presented to our outpatient clinic with the complaint of hip pain. Dislocation of the hip without any disruption of the reinforcement ring was determined on



Figure 1. Antero-posterior view of the pelvis showing dislocation of the left hip prosthesis with intact reinforcement ring

X-rays (Figure 3). We offered revision surgery, but patient preferred to be treated in another clinic.

Discussion

The first case is a patient who was hospitalized for five months because of infection and multiple surgeries. After elimination of infection, revision surgery was performed and the patient returned daily life. The constrained acetabular liner was the source of confidence about stability of the hip. However, unexpectedly, the patient presented with dislocation. There is a risk of dislocation even if the constrained liner is correctly placed. Thoms and Marwin (6) reported a patient with two dislocations of a tripolar constrained acetabular liner caused by impingement. Tufescu and Dust (7) reported two cases of failed constrained THA caused by skirted femoral stem. In our case, we observed impingement because of constrained liner malrotation. The inferior finger of the constrained liner was disrupted. The liner was at the 2-8 o'clock position. A new liner was placed at the 1-7 o'clock position and we gained more range of motion without impingement.



Figure 2. Intraoperative photograph demonstrating malpositioned and disrupted constrained liner



Figure 3. Antero-posterior view of the pelvis showing dislocation of the right hip with intact reinforcement ring

Conclusion

The Trilogy® constrained acetabular liner is a good choice for patients who have high risk of dislocation. Even with constrained acetabular liner, dislocation of the hip is not impossible. When using constrained liners, caution should be exercised against the risk of impingement. Proper assessment of the constrained liner is mandatory. Otherwise, disruption of the liner is not a surprise. Instructions of the manufacturer should be followed. It can also be accepted as a disadvantage of the product that such a small misplacement has such great consequences.

It may be difficult to determine the proper rotation of the polyethylene liner during surgery. Therefore, it would be appropriate to have a wider range of correct polyethylene placement angles. Even if there is adequate stability in the operation, we must inform the patient about the allowed range of motion after the operation.

Authorship Contributions

Surgical and Medical Practices: D.A., F.G. Concept: D.A. Design: D.A. Data Collection or Processing: F.G. Analysis or Interpretation: F.G. Literature Search: D.A. Writing: F.G.

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