



Excess retained cement in the posteromedial compartment after unicondylar knee arthroplasty

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Acute mechanical symptoms due to excess retained cement in the posterior compartment of the knee joint following unicondylar knee arthroplasty (UKA) are uncommon. Infection, aseptic loosening, polyethylene wear and progressive arthritis are well-documented complications of UKA procedure. We present a patient with acute pain and 'clicking' sensation in the knee joint due to cement extrusion in the posteromedial compartment after UKA. Full functional recovery was achieved after arthroscopic removal of the cement debris. Of retrospectively screened 43 UKA cases, asymptomatic cement extrusion was detected in 8 patients in the posteromedial compartment on direct X-rays. Careful inspection of components is essential to minimize the risk of cement extrusion into the posterior compartment and perioperative fluoroscopy may be helpful during UKA procedure.

Key words: Arthroplasty; arthroscopy; bone cement; foreign body; pain.

Unicondylar knee arthroplasty (UKA) has become a successful surgical procedure with good outcomes when strict indications are followed in the treatment of one-compartment arthritis of the tibiofemoral joint.^[1,2] Common complications of UKA include infection, aseptic loosening, polyethylene wear and progressive arthritis in the other compartments of the knee.^[2-4] Minimally invasive surgery with limited exposure may lead to cement extrusion in the posterior part of the affected compartment which is not seen commonly. In two to five year follow-up of our 43 UKA procedures, retained cement was detected retrospectively in 8 asymptomatic patients in the posteromedial compartment adjacent to tibial component. We report a 45-year-old woman who presented with acute pain, swelling and limited range of motion while bending due to cement extrusion in the posteromedial compart-

ment of the knee joint after UKA and 8 asymptomatic patients with retained cement. Arthroscopic removal of the excess retained cement through the posterior portals was successfully performed. Complete resolution of the symptoms was achieved at follow-up.

Case report

A 45-year-old woman presented with right knee pain that was localized to medial compartment for 3 years. Both physical examination and radiographic findings confirmed advanced osteoarthritis of the medial compartment of the right knee. She underwent a unicondylar knee arthroplasty with minimally invasive technique. Both femoral and tibial components were cemented and polyethylene thickness was 9 mm (Biomet Ltd, Bridgend, UK).

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Four weeks after surgery, the patient presented with unresolved pain in the posteromedial aspect of the knee after a 'clicking' sensation. In physical examination, mild effusion and localized tenderness were noted on the posterior aspect, and range of motion was limited to 110 degrees of flexion with a 'clicking' sensation. Although slight elevation of ESR and CRP normally could be expected during four weeks after surgery, laboratory data (complete blood count, erythrocyte sedimentation rate, C-reactive protein, and bleeding markers) and neurovascular examination were within normal ranges. Radiographs revealed a loose fragment of cement lying adjacent to tibial component in the posteromedial compartment of the knee (Fig. 1).

Arthroscopy of the right knee was performed (Fig. 2), and a large, loose fragment of cement was removed from the posteromedial aspect of the knee. First, anteromedial and anterolateral portals were used to examine the components and polyethylene insert. Any findings of component loosening, insert malposition or polyethylene wear were not detected. Fibrous interposition near intercondylar notch area led to limited joint space which restricted us from reaching and seeing the posterior aspect even with a 70-degree arthroscope. In order to achieve direct visualization, posterior portals were used to remove the retained cement while the knee was in 90-degree flexion to prevent peroneal nerve palsy and popliteal neurovascular damage. In posterior-posterior triangulation method, scope was introduced from the posterolateral portal and the grasp was inserted from the posteromedial portal. Retained large cement fragment adjacent to posterior aspect of the tibial component was removed (Fig. 3). Radiographs obtained postoperatively demonstrated complete removal of cement debris from the posteromedial compartment of the knee, postoperatively. At 4-week follow-up, complete recovery from the symptoms and full range of motion were achieved. Of retrospectively screened 43 UKA cases, asymptomatic cement extrusion was detected in 8 patients in the posteromedial compartment on direct X-rays, and a limited ROM may be expected on the physical examination of these patients.

Discussion

Unicondylar knee arthroplasty has been preferred treatment method in advanced one-compartment arthritis for more than 30 years despite early unfavorable results.^[1] Recent studies have demonstrated 10-year-survival of UKA ranging from %85-95 with good clinical outcome.^[1,5,6] Lower cost, shorter hospitalization, less soft tissue injury and better rehabilitation are some of the advantages over total knee arthroplasty in

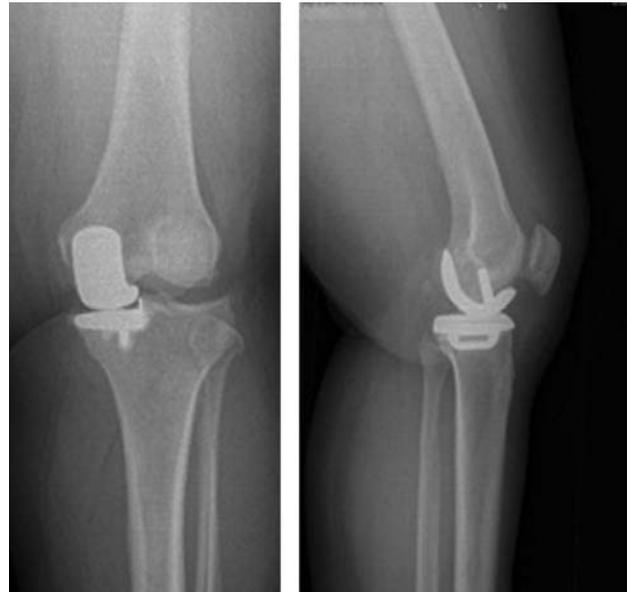


Fig. 1. Loose fragment of cement lying adjacent to tibial component in the posteromedial compartment of the knee.

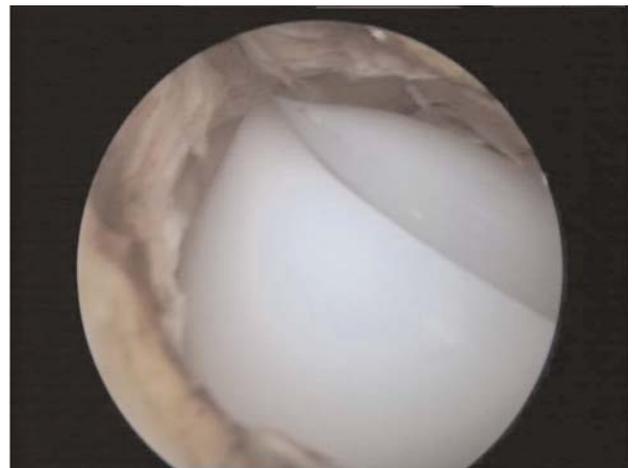


Fig. 2. Arthroscopic view of posteromedial compartment. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]



Fig. 3. Removed cement fragment. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

properly selected cases.^[1,5,7] On the other hand, surgeon experience due to sharp learning curve, inappropriate patient selection, and implant design may play major role in component failure and adversely influence the outcome.

Minimal invasive surgery technique has also been applied for UKA procedures with the purpose of less soft tissue injury, less postoperative pain and discomfort and quicker return to daily activity.^[1,2,6] Nevertheless, limited exposure with shortened incision may lead to inadequate visualization of the posterior aspect of both the compartment and the components. Furthermore, tibial component itself restricts to visualize the posterior part of the knee. Standard instrumentation equipment could not achieve to reach and see the cement extrusion at the posterior site after component insertion. Ultimately, there is an increased risk for an unrecognized complication such as retained cement debris, bone or soft tissue in the posterior part of the compartment.

There are only a few reports regarding cement extrusion in the posterior compartment after UKA. At a mean of 7.5-year follow-up Berger et al. reported two reoperations from a series of 62 UKAs, one of which was due to retained cement.^[8] Howe et al. reported four cases of retained cement after UKA that were successfully removed by arthroscopy, and they concluded that arthroscopy was an effective technique that provided quicker functional recovery.^[6] Kim et al. presented a case of cement extrusion after UKA that was treated by arthroscopy with posterior portals.^[7] In our case, arthroscopy with anterior portals revealed fibrous interposition near intercondylar notch leading to limited joint space and restricted visualization of the posterior aspect of the knee. There were no signs of component loosening, polyethylene insert failure, and contralateral compartment involvement.

Forceful attempts to reach and remove the cement debris may lead to loosening of additional cement fragments and the components.^[6] We also used posterior portals to remove the cement debris since anteromedial and anterolateral portals were inadequate to have a full examination of posteromedial aspect. In retrospective analysis of our 43 UKA cases, we detected eight asymptomatic cement extrusion adjacent to tibial component in the posteromedial compartment with near full range of motion.

In order to avoid cement extrusion, we recommend to use the necessary amount of cement estimated for the components and the bony surfaces. After implantation, a careful inspection of components is crucial to decrease the risk of cement extrusion. Nerve hooks may be help-

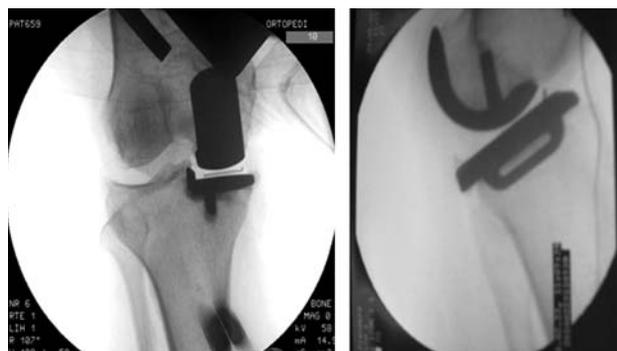


Fig. 4. Perioperative fluoroscopic views.

ful to remove bulging cement from the posterior compartment.^[6] Dental mirrors can be also used to have an indirect visualization of the posterior part of the components.^[6] Marsland and Bradley described the use of a dental tool which has blunt ends aligned perpendicularly to each other that are perfectly angled to allow the rapid removal of excess cement from the posterior aspect of the components during prosthesis insertion.^[9] Intraoperative fluoroscopy may be helpful to evaluate component position and excess retained cement in the knee joint. We routinely get fluoroscopic views before ending the operation (Fig. 4).

Retained cement following unicompartmental knee arthroplasty (UKA) is a newly recognized complication which may result in pain, impingement, acute mechanical symptoms, and damage to the prosthetic components within the compartment. Infection, loosening and component failure should be ruled out with conventional diagnostic tools before additional surgery. Our eight asymptomatic cases do not add to the symptomatic one but act as an audit to suggest that we need to address this problem in the operative technique. Arthroscopic removal of excess retained cement is successful and should be considered for symptomatic patients to manage such complications.

Conflicts of Interest: No conflicts declared.

References

1. Jamali AA, Scott RD, Rubash HE, Freiberg AA. Unicompartmental knee arthroplasty: past, present, and future. *Am J Orthop (Belle Mead NJ)* 2009;38:17-23.
2. Chesnut WJ. Preoperative diagnostic protocol to predict candidates for unicompartmental arthroplasty. *Clin Orthop Relat Res* 1991;(273):146-50.
3. Barrett WP, Scott RD. Revision of failed unicondylar unicompartmental knee arthroplasty. *J Bone Joint Surg Am* 1987;69:1328-35.
4. Cartier P, Cheaib S. Unicondylar knee arthroplasty. 2-10 years of follow-up evaluation. *J Arthroplasty* 1987;2:157-62.

5. Larsson SE, Larsson S, Lundkvist S. Unicompartamental knee arthroplasty. A prospective consecutive series followed for 6 to 11 years. *Clin Orthop Relat Res* 1988;(232):174-81.
6. Howe DJ, Taunton OD Jr, Engh GA. Retained cement after unicondylar knee arthroplasty. A report of four cases. *J Bone Joint Surg Am* 2004; 86:2283-6.
7. Kim WY, Shafi M, Kim YY, Kim JY, Cho YK, Han CW. Posteromedial compartment cement extrusion after unicompartamental knee arthroplasty treated by arthroscopy: a case report. *Knee Surg Sports Traumatol Arthrosc* 2006;14:46-9.
8. Berger RA, Nedeff DD, Barden RM, Sheinkop MM, Jacobs JJ, Rosenberg AG, et al. Unicompartamental knee arthroplasty. Clinical experience at 6- to 10-year follow-up. *Clin Orthop Relat Res* 1999;(367):50-60.
9. Marsland D, Bradley NW. Use of a dental tool to remove excess cement in unicompartamental knee arthroplasty. *Ann R Coll Surg Engl* 2009;91:520-1.