



# 자가 슬개건을 이용한 전방십자인대 재건술 시 경골터널 생성중 핵심 확공기의 파열 - 증례보고 -

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## Breakage of Core Reamer During Anterior Cruciate Ligament Reconstruction -A Case Report-

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This is a case of the core reamer breakage during anterior cruciate ligament reconstruction using bone-patellar tendon-bone autograft. A 19-year-old man with acute anterior cruciate ligament rupture had reconstruction surgery. During tunneling in the proximal tibia, the core reamer have been cracked open and broken. Rest of the procedure was performed routinely except the tibial sided fixation of bone block which was performed with larger interference screw than usual. The patient followed the accelerated rehabilitation program. The result was satisfactory at 2 years after surgery.

**KEY WORDS:** Knee, Anterior cruciate ligament reconstruction, Patellar tendon, Core reamer

Core reamer is used for creating tibial tunnel and producing bone plug for graft in anterior cruciate ligament reconstruction, especially with bone-patellar tendon-bone autograft. To the best of our knowledge, there are no reports on the breakage of the core reamer during anterior cruciate ligament reconstruction. Based on our experience, we report a case of the core reamer breakage in young male patient.

### Case Report

A 19 year-old man had twisting injury on the right knee during a basketball. The physical examination revealed moderate effusion, limitation of motion, and positive Lachman test. The findings of physical examination and MRI were consistent with anterior cruciate ligament rupture (Fig. 1). The knee was immobilized with long leg splint for 2 weeks and range of motion exercise was performed after swelling subsided. At 3 weeks after injury, the knee had full range of motion and Lachman test was still positive with soft end point.

The anterior cruciate ligament reconstruction was performed. 10 mm sized bone-patellar tendon-bone autograft was used. After the guide wire was inserted through tibial tunnel guide, near cortex was

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removed using flower tip reamer and a cordless drill. Then the guide wire was replaced with collared guide pin and 10 mm-sized core reamer (Arthrex, Naples, Florida) was used for tibial tunnel. It advanced easily over the collared pin until a resistance was felt which led us to think that the tip of the core reamer reached subchondral compact bone. Reaming was kept under arthroscopic observation but the reamer could not advance further through far subchondral bone. As time went on, fine metal debris leaked through entry site. We tried to pull out the reamer but we couldn't because it was caught in the

tunnel. At last, the tip of the reamer and its fragment were seen arthroscopically. After pulling out the reamer with difficulty, we discovered that the tip of the reamer was cracked open and broken (Fig. 2).

Fortunately, the fragments were removed completely. Despite the widening of the tibial tunnel, further procedure was completed and the 10×25 mm sized tibial sided bone block was fixed with 9×25 mm sized interference screw in the tibial tunnel (Fig. 3). After the surgery, Lachman test was negative and pivot shift test was positive without clunk. The patient completed postoperative accelerated rehabil-

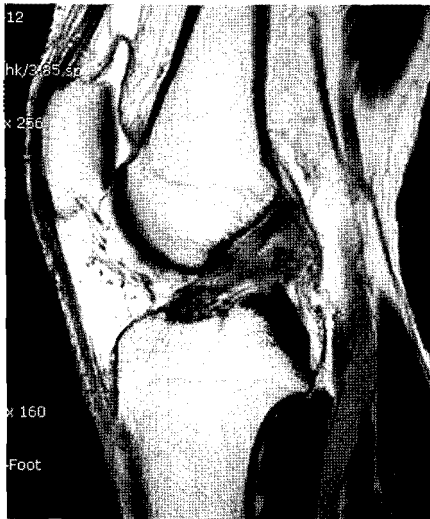


Fig. 1. Magnetic resonance imaging taken 2 days after injury shows high signal intensity in anterior cruciate ligament and marked joint effusion.

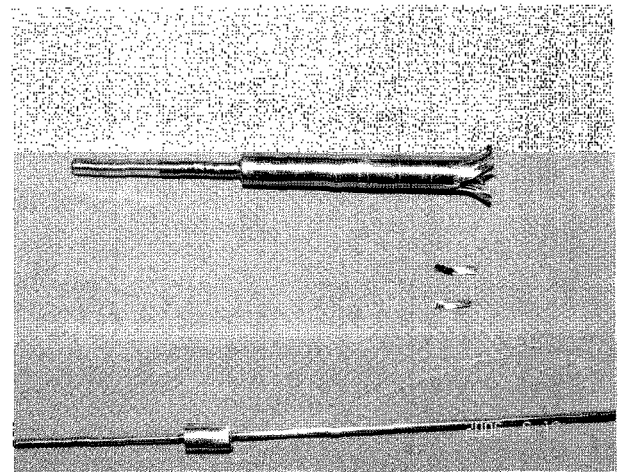


Fig. 2. Intraoperative picture shows broken core reamer and collared guide pin. The tip of the core reamer is cracked open. A few fragments are also seen.

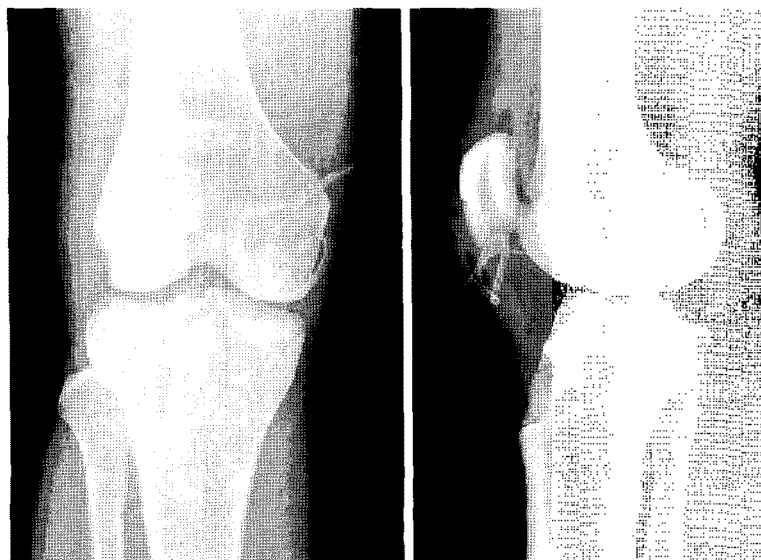


Fig. 3. Postoperative radiographs show wide tibial tunnel.

itation program<sup>9</sup>. At 2 years follow-up, physical examination revealed full range of motion, grade 1 positive on Lachman test, and slightly positive on pivot shift test without clunk. Tunnel widening was minimal on radiograph.

### Discussion

Many orthopaedic surgeons use a core reamer during anterior cruciate ligament reconstruction to get autogenous bone plug for supplement to tibial aperture or bone defect of the donor site. The authors use a core reamer during reconstruction using bone-patellar tendon-bone autograft. In many orthopaedic centers the core reamers used for anterior cruciate ligament reconstruction are re-used. Re-use of core reamers is likely to have high risk of failure. The authors did not recognize or even doubt the breakage despite the unusual resistance until the reamer advanced through the tibial articular cartilage. The exact cause of the breakage was not determined. The broken core reamer had several cracks and all crack began between sawteeth. We examined other re-used core reamers after experiencing this case and discovered that many of them had fine cracks at the gullets (between sawteeth) and these gullets are considered to be the weak points (Fig. 4). Blunt sawteeth of used reamers are proposed to be one of the causes. Wear of the sawteeth of the core reamer is considered to cause more friction heat<sup>11</sup>. Heat may affect the mechanical properties such as resistance to breakage. There are no reports about the friction

heat during reaming with core reamer. The friction heat may cause the mechanical or thermal fatigue crack resulting in the breakage. The low-powered cordless drill can be one of the causative factors. Many authors reported that the heat production at the cutting site was affected by drill speed and load<sup>2,9</sup>. The cordless drill tends to slow down under load more than high-powered drill such as air drill. More friction heat generated at the cutting site and high temperature is considered to affect the cracked core reamer. Use of high-powered drill might have to be considered when a patient is young and has a good quality of bone. The crack on the core reamer should be checked. Surgeon should be concerned about breakage if unusual resistance is felt during reaming.

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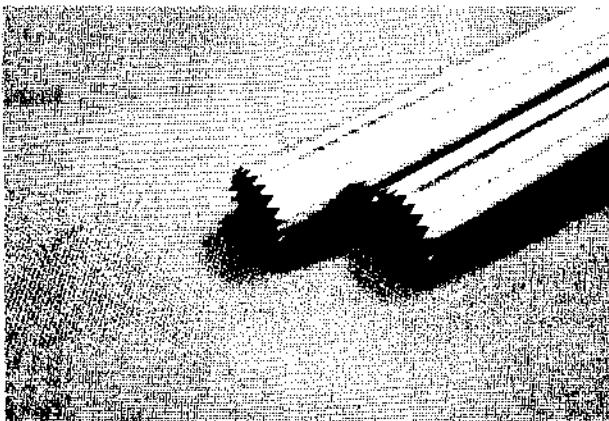


Fig. 4. Re-used (left) and new (right) core reamers. Re-used core reamer has worn sawteeth and many fine cracks between sawteeth (gullets).