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비만환자에서 시행한 슬관절 관절경술 - 증례 보고 -

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Knee Arthroscopy in the Obese: A Case Report

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Several reports have described the increased perioperative risks as well as surgical techniques for performing various procedures in obese patients. However, few reports have addressed the effects of obesity on routine arthroscopic procedures known to be common and safe. Describing the case of a partial meniscectomy performed in a 17-year-old male with a body weight of 120 kg, we review literatures published to the present and provide technical problems and possible complications that can occur when performing routine knee arthroscopy in bariatric patients.

KEY WORDS: Knee, Obesity, Arthroscopy, Meniscectomy

The proportion of the Korean population that is obese increased from 2.3% in 1998 to 4.1% in 2007 and the Korea Ministry for Health, Welfare and Family Affairs expects this proportion to continue to increase[7]. Several reports have described the increased perioperative risks as well as surgical techniques for performing various procedures in obese patients[4,6,8,9,12,14-16]. However, few reports have addressed the effects of obesity on routine arthroscopic procedures[1,5,11]. Describing the case of a partial meniscectomy performed in a 17-year-old male with a body weight of 120 kg, we review literatures published to the present and provide technical problems and possible complications that can occur when performing routine knee arthroscopy in bariatric patients.

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Case Report

1. Clinical and radiographic description

A 17-year-old male presented with right knee pain after a deceleration injury incurred during a soccer game one month prior to his visit. The patient was 177 cm tall and weighed 120 kg (body mass index 38.3 kg/m^2) without comorbid medical conditions. His weight made the physical examination difficult to perform and it ultimately proved uninformative with the exception of a positive squat test. Magnetic resonance imaging (MRI) demonstrated a radial tear in the lateral meniscus (Fig. 1). Preoperative protocol included weight reduction before surgery, with a continued program of weight reduction and rehabilitation after surgery.

2. Surgical Description and Progress

The patient received general anesthesia after fail-

ure of spinal anesthesia. Although it was tight, circumferential leg holder was used with padding for a better control over the knee and a 42 inch extra-wide tourniquet cuff was inflated up to 350 mmHg. Patella which was readily palpated was outlined with a sterile marker and identification of other bony landmarks was confusing. Knee arthroscopy was performed using a 30° angled, 4 mm diameter arthroscope with a working length of 170 mm. Placement of anterolateral portal was too proximal because of difficulty in identifying joint line and anteromedial portal was made under direct visualization through errant anterolateral portal. Before making the anteromedial portal, we used an 18 gauge spinal needle to confirm a trajectory parallel to the tibial plateau. An adequate anterolateral portal was

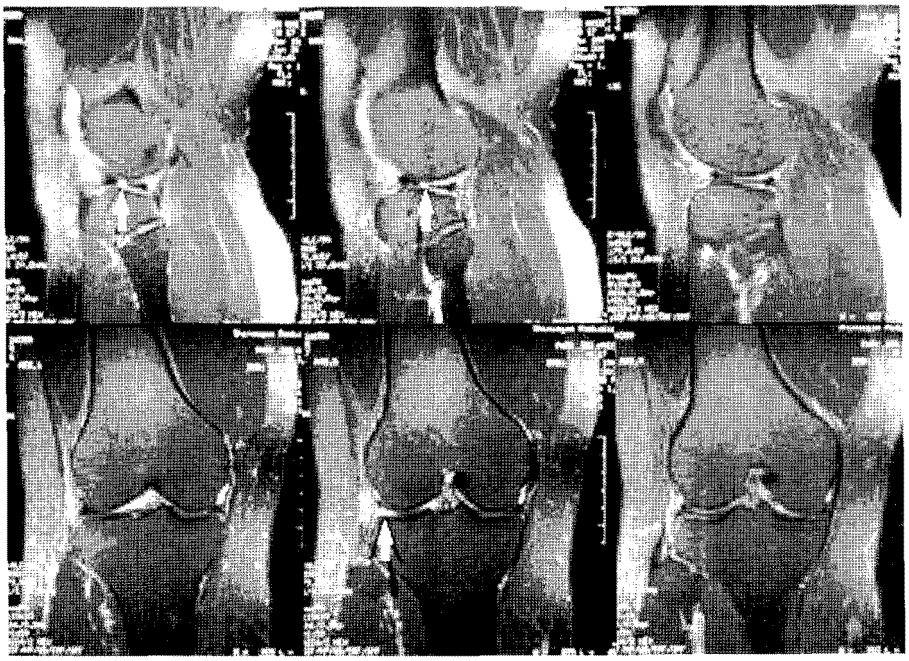

Fig. 1. Preoperative MRI shows a radial tear (arrows) in the lateral meniscus on sagittal (**A**) and coronal views (**B**).

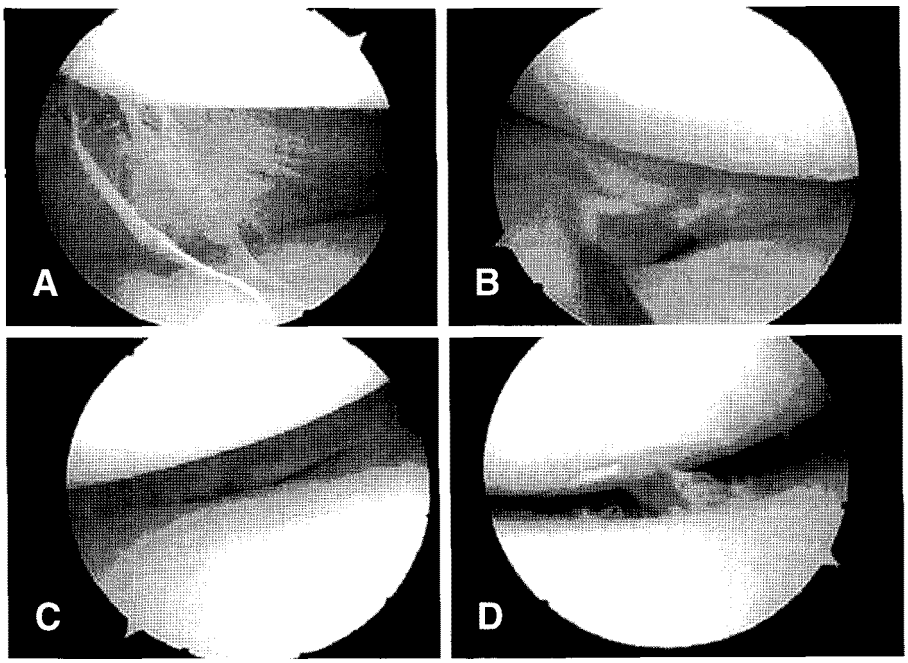

Fig. 2. Arthroscopic findings demonstrate fibrillation on the patellar cartilage (**A**) and lateral meniscus before (**B**) and after (**C**) partial meniscectomy. After meniscectomy, iatrogenic chondral damage was detected on the lateral femoral condyle (**D**).

established alternatively using same technique through the anteromedial portal.

A posteromedial portal was made for thorough evaluation of medial meniscus in this patient with tight medial compartment. Arthroscopic findings included fibrillation on the patellar surface and a radial tear in the middle of the lateral meniscus. We performed a partial meniscectomy with the assistance of finger pressure over the lateral joint line and iatrogenic cartilage damage was detected after the procedure (Fig. 2). The procedure duration included 40 minutes to induce anesthesia and 45 minutes to complete surgery, which was about 40 minutes longer than the average duration of routine meniscectomies. We performed a routine postoperative protocol and the patient was discharged uneventfully.

Discussion

According to the World Health Organization, obesity is defined as body mass index (BMI) more than 30 kg/m^2 [8]. Obesity itself can impair pulmonary function and increase the incidences of comorbidities such as hypertension, diabetes, hyperlipidemia and decreased antithrombin III level, which in turn contribute to stroke and myocardial infarction[3,9,10,13]. Also, there have been many reports of surgical complications and morbidities in bariatric patients: longer operation time[6,9,12], large incisions[9,15], wound problems including infection[9,12,16], excessive blood loss[6,8,9,12,15,16], prolonged hospitalization[4,15] and higher rates of pulmonary atelectasis[9,15], thromboembolic events[12], prosthetic loosening and implant failure[14], 16 than in patients of normal body weight. However, few reports have addressed the effects of obesity on routine knee arthroscopy[1,5,11,17].

Obese patients may necessitate additional efforts during preoperative evaluation and arthroscopic procedures, even for experienced arthroscopic surgeons[1,11]. The inherent difficulties of performing reliable physical examinations in obese patients forces clinicians to rely on MRI more often than for patients of normal body weight. Spinal anesthesia is often ineffective and converted to general anesthesia. Regular-sized surgical tables may not accommodate obese patients, requiring the use of adjacent surgical tables placed side by side. When extra-wide tourniquets will not suffice for adequate compression in obese patients, two must be taped together. On occasion, the patient's thigh is so large that the use of a lateral post must be considered instead of a circumferential leg holder. The placement of portals may be complicated by eccentric distributions of fat tissue and difficulty in palpating bony landmarks. Sometimes, the patella is the only palpable structure. Additional portals may be necessary due to leg holder ineffectiveness or errant portals. Surgeons must anticipate prolonged operation times and complications such as spinal anesthesia headache, thromboembolic events and prolonged portal drainage. Even if their jobs are not physically demanding, obese patients may experience delayed return to work or daily activity and worse outcomes related to quality of life than those of normal weight after arthroscopic procedures[1,5].

In conclusion, arthroscopic surgeons must consider additional technical problems and unexpected surgical complications when performing procedures in these obese patients.

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초 록

비만환자에서 유용한 수술적 술기와 증가된 술전 및 술후 위험성에 대한 보고들은 있으나, 비만이 관절경적 시술에 미치는 영향에 대한 보고는 거의 없는 실정이다. 저자들은 체중 120kg의 17세 남자환자에서 반월상연골 부분절제술을 시행한 후, 현재까지 출간된 문헌들을 고찰하고 비만환자들에서 슬관절 관절경술 시행시 발생할 수 있는 합병증과 수술적 술기에 대한 정보를 제공하고자 한다.

색인 단어: 슬관절, 비만, 관절경술, 반월상연골 절제술