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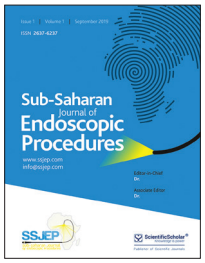

Case Report

Arthroscopic removal of multiple foreign bodies in the knee: A case report

Gerald Chukwuemeka Oguzie[1], Joseph Ikechukwu Ofoegbu[1]

[1]Department of Orthopaedics, Federal Medical Center, Owerri, Imo, Nigeria.

***Corresponding author:**
Gerald Chukwuemeka Oguzie
Department of Orthopaedics,
Federal Medical Center,
Owerri, Imo, Nigeria.

geraldoguzie@yahoo.com

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ABSTRACT

We report the uncommon case of knee arthroscopic removal of multiple bullet pellets. A 25-year-old male professional footballer was admitted with left knee swelling, pain, and limitation of movement following a gunshot injury. Radiographs revealed multiple pellets in and around the left knee, each measuring about 5 mm in diameter. There were several pellets in the subcutaneous, intramuscular, and intra-articular parts of the left knee. The pellets were metallic, contraindicating magnetic resonance imaging to assess intra articular structures. He was booked for an urgent knee arthroscopy and the pellets were retrieved, and the other vital intra articular structures were examined. Three 5 mm diameter spherical bullet pellets were removed from the joint cavity. The synovial membrane was debrided, and the knee lavaged. Recovery was satisfactory with no complications. The patient was discharged to physiotherapy and followed up at 3 and 6 months after surgery. Foreign bodies in the knee are not uncommon; however, the presence of multiple bullet pellets is rare, especially in the index case of a sportsman. Its removal can be challenging, even arthroscopically. Such a procedure can result in severe complications, such as infections and joint deformities. The decision to use the arthroscopic approach requires careful deliberation regarding the status of the patient vis-a-vis the available skill and experience of the managing team.

Keywords: Arthroscopy, Bullet, Pellets, Foreign body

INTRODUCTION

The presence of multiple foreign bodies in the knee joint space is uncommon and is commonly managed by open technique, especially in our clime with paucity of arthroscopic equipments in institutions and lack of required skills. This arthroscopic technique is beneficial because it allows for proficient visualization of the pellets and thorough vision of all compartments of the knee with reduced blood loss and decrease in surgical injuries to the surrounding structures and finally, early return to function, especially in the index case of a sportsman. We report a successful case of multiple bullet pellets in the knee that was managed with arthroscopic retrieval. The patient was followed for 6 months with favorable results. The clinical manifestations, diagnosis, and treatment options of multiple bullet pellets in the knee were discussed in this report and related literature reviewed.

CASE REPORT

A 25-year-old male professional footballer was admitted with sudden onset of the knee pain and difficulty to walk with the left lower limb following a gunshot injury to the left knee of 8

hours duration prior to presentation. The pain was dull in nature and non-radiating. There was associated swelling which was diffuse. There were multiple pellet wounds on the left knee. The gun from description was a low-energy rifle. On admission, his vitals were; temperature 36.8°C, pulse rate 78/min, respiratory rate 20/min, and blood pressure 125/75 mmHg. Multiple 0.5 mm sized lacerations were present on the superomedial and anterolateral surface of the left knee [Figure 1]. There were multiple areas of swellings and tenderness observed with palpable subcutaneous pellets. The left knee had a ballotable patella confirming the presence of effusion. Laboratory results were unremarkable with no evidence of infection. Anteroposterior and lateral radiographs of the left knee [Figure 2] revealed about thirty spherical shaped opaque foreign bodies in and around the left tibiofemoral space, each measuring 5 mm. There were considerations of the possibility of damage to the cruciate ligaments and other intra-articular structures. With the finding of metallic foreign bodies, magnetic resonance imaging was contraindicated. He was booked for urgent arthroscopy under regional anesthesia. Written informed consent was obtained. Routine skin preparation and draping exposing the left knee were done. Prophylactic intravenous antibiotics was administered. A pneumatic tourniquet was applied at the mid-thigh and port sites marked with a sterile skin marker. Examination under anesthesia revealed multiple wounds over the left knee; however, no joint instability was elicited. Arthroscopy was performed to remove the intra-articular pellets. The patella was approached inferolaterally through an anterolateral portal using a 2.7 mm 30° arthroscope in a 2.9 mm arthroscopic sheath, and a large collection of hematoma was found in the articular cavity, of which 5 ml was collected for microscopy, culture, and sensitivity. Normal saline fluid irrigation by gravity was done to allow better visibility. Arthroscopic evaluation of the intra-articular spaces and structures revealed three intra-articular pellets [Figure 3]. These were extracted using graspers under direct vision. An articular cavity washout was done with normal saline. Debridement of the synovial membrane was done using a shaver. Other readily accessible and palpable pellets were also retrieved. Postoperatively, he continued on antibiotics and analgesics. The result of the microscopy and culture yielded no growth of organism after 48 h. He was mobilized with crutches and continued wound care. The patient's recovery was satisfactory with no complications, and he was followed up at 3 and 6 months, respectively.

Figure 1: Picture showing the left knee with multiple pellet wounds.

Figure 2: Radiograph showing the left knee with multiple round opacities(bullets) within the various compartments of the knee. The figures are already arranged in a chronological order in the writeup.

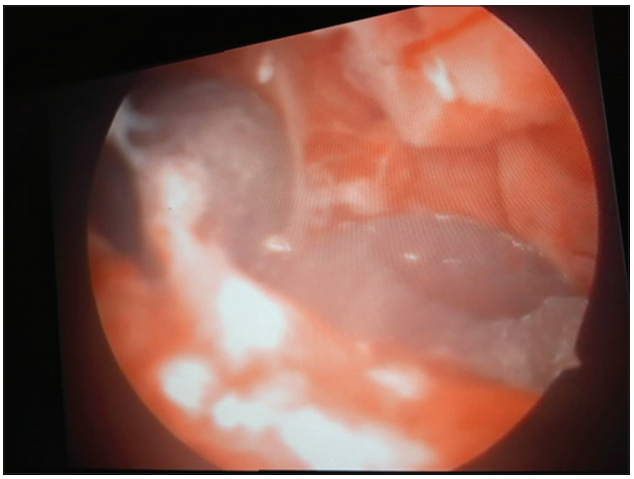

Figure 3: Arthroscopic view of the intra-articular pellets.

DISCUSSION

Multiple foreign bodies within the knee are rare; only a few cases have been reported in literature. The presence of intra-articular bullet pellets can result in remarkable tissue damage. Berg and Ciullo and Cho and Warme reported arthroscopic retrieval of intra-articular low-velocity bullet from the knee.[1,2] Hartford and Gorczyca reported two cases of late arthroscopic

debridement of metal fragments and synovectomy following penetrating low velocity missile injury to the knee joint.[3] Gutierrez reported an unusual injury involving a bullet pellet which eventually migrated into the knee joint cavity.[4] Lee *et al*. also reported cases of intra-articular bullet extraction using a minimally invasive technique.[5] As well Nikolic discussed the arthroscopy of the knee in war injuries.[6] Petersen *et al*. reported the removal of a projectile from the intra-articular cavity of the knee joint.[7] Sansone *et al*. used arthroscopy to retrieve an unusual knee intra-articular foreign body.[8] Yong *et al*. reported the case of a large foreign body retrieved from the knee.[9] Schroeder *et al*. reported a migrating shrapnel as a rare cause of knee synovitis.[10] White, in his review, discussed arthroscopy as a valuable tool for retrieval of bullets, similar to most case reports of foreign bodies in knee joints involving a bullet.[1-11] With magnification, it can be a challenge to extract small smooth spherical objects with arthroscopy. The smooth rounded body of the bullets makes further migration easy and increases the difficulty with grasping the pellets. Such procedures should be performed by an experienced arthroscopy surgeon to reduce the tourniquet time and ensure a favorable outcome. This is similar to the reports of others.

CONCLUSION

Foreign bodies in the knee are not uncommon. Most foreign bodies can be removed with arthroscopy. In particular, with magnification, it remains relatively easy to extract small irregular shaped objects with arthroscopy; however, challenges abound in the case of a smooth rounded metallic pellet, thereby increasing patient and surgeon's concern about such procedure. Accordingly, we recommend arthroscopic retrieval for small objects. Such surgery can result in severe complications, such as infections. Selecting the approach requires careful consideration of the condition of the patient and the skill, knowledge, and experience of the medical team.

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Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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