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Hernia through an Iliac Crest Bone Graft Harvest Site: Two Cases Treated Differently

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Abstract

Background: Bone graft is frequently used during orthopaedic procedures. Multiple complications are associated with bone graft harvest from the iliac crest. Structural bone graft harvest can lead to the development of a rare complication of a hernia through the iliac deficit.

Methods: We report two cases of transiliac herniation following a structural bone graft harvest. The first case was a 71 years-old woman who initially underwent a foot fusion with a ipsilateral bone graft harvest. She underwent three surgical hernia repairs using a mesh sutured to the adjacent muscles to cover the defect. At the last follow-up, the patient presented with a third recurrence of the hernia. The second case is a 79 years-old female who initially underwent a total hip replacement associated with an ipsilateral bone graft harvest. Twenty-four years later, she presented with a transiliac hernia. The patient underwent surgery and in this case, the mesh was sutured to bone with a corkscrew anchor. At the last follow-up, the patient did not present any recurrence of the hernia.

Conclusion: The use of a corkscrew anchor to fix the mesh rigidly through the iliac bone seems to offer a fast recovery with minimal complications compared to the standard technique where the mesh is loosely fix to the adjacent muscles. This hernia repair technique seems to offer better results and less recurrence. A study comparing the two techniques with more patients involved would help confirm our findings.

Keywords: Hernia repair; Iliac bone graft harvest; Transiliac herniation; Bone graft harvest complication; Iliac crest; Abdominal hernia

Introduction

Bone graft is frequently used during orthopaedic procedures. Among all types of grafts available, autograft remains the gold standard. Autograft can be harvested from the iliac crest, the proximal or distal tibia and the calcaneus. The iliac crest is frequently used for structural bone graft. There are many complications related to iliac crest bone graft harvest. The most frequent complication reported is chronic pain at the donor site with an incidence of 1.7%-26% [1,2]. Other complications reported in the literature are: sensory deficit from the lateral cutaneous femoral and cluneal nerves (0.6%-29% [3,4]), infection (0.5%-7.5% [2,4]), hematoma (2.1%-6.7% [4,5]) and cosmetic problems related to the scar (1.2%-15.6% [1,3]). Additionally, rare complications can occur such as ureteral problems, arterial trauma, fracture, sacro-iliac instability or herniation through the iliac bone [6]. The first case of hernia trough the iliac bone secondary to a bone graft harvest was first reported in 1945 [7]. Since 2000, 18 cases of hernia secondary to iliac crest bone graft harvest were reported in the literature [8-20]. We report two cases of transiliac herniation where the surgical hernia repairs were performed differently in the same institution. One case recurred three times so far while the other one had excellent outcomes without recurrence.

Case Reports

Case 1

The first case is a 71 years-old lady with a body mass index (BMI) of 25.0 who initially uunderwent a left talo-navicular fusion. A structural bone graft harvest was performed at the ipsilateral iliac crest. She presented five months after the initial surgery with a mass at the harvest site during a follow-up visit for her foot. Clinically, the mass was sensitive and reducible. The diagnosis of hernia through the iliac crest deficit was confirmed by ultrasounds imaging. The bone defect measured 2 × 3.5 cm. The general surgeon performed the hernia repair with reduction of the hernia and the use of a mesh to cover the iliac bone deficit. Two days after surgery, the patient went back to the hospital with a recurrence of the hernia. Another surgery was therefore performed three weeks later. The old mesh was removed and more dissection was completed to ensure muscles were not detached from the iliac bone. A new mesh was attached to the iliac crest periosteum and under the superior muscles (anterior abdominal wall muscles and latissimus dorsi) (Figure 1).

Six week later, a follow-up CT scan confirmed another recurrence of the same hernia. The patient underwent a third surgery one month later. This time, the peritoneum was opened to evaluate the integrity of the anatomy and the left colon hernia was reduced. The second mesh was removed and the surgeon sutured a new mesh at the intersection of the iliac crest, the anterior abdominal wall muscles and the latissimus dorsi. This mesh was positioned to overhang the left iliac crest and was sutured anteriorly to the anterior abdominal wall muscles and latissimus dorsi and posteriorly to the gluteus muscle. She left the hospital two days after the surgery without any complication. The patient was referred again by her family physician two years later for a new mass at the level of the bone graft harvest. No additional investigation was undertaken to confirm the diagnosis of a recurrent hernia because there was no functional impairment. Surgical risks were considered too high to perform another hernia repair. Therefore, supportive treatment was undertaken.

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Figure 1: Axial view of abdominal CT Scan demonstrating the transiliac hernia through the left iliac bone (blue arrow) (Case 1).

Case 2

The second case is a 79 years-old female with a BMI of 33.7. Her initial procedure was a left total hip replacement. During this surgery, a structural bone graft harvest was performed on the left iliac crest. The patient presented 24 years later with a painful mass at the level of the left lower abdomen. The mass appeared suddenly in the last 24 hours and increased in volume when the patient was standing and walking. The patient also complained of constipation for the last five days but denied any occlusion symptoms. The mass was localized in the postero-lateral aspect of the left iliac crest and was reducible. Pain was present at the left iliac fossae without any abdominal rigidity. The CT scan confirmed the diagnosis of transiliac herniation, with a bone deficit of 5 × 5 cm. No sign of intestinal obstruction or strangulation was observed. In this case, the surgery consisted of a laparoscopic hernia repair with an intraperitoneal mesh fixed to the bone by a corkscrew anchor. First, the sigmoid colon was reduced. Then, the mesh was fixed to bone by a corkscrew anchor at the infero-lateral corner of the deficit. Other attempts to put a second corkscrew anchor were unsuccessful. Finally, a transosseous suture was used to fix the mesh on the medial and superior side with Absorbatack® staples (Covidien, Dublin, Ireland) and anchor sutures were tied and securely fixed to the mesh. No complication was reported after the surgery. Her constipation was treated medically and her bowel activity resumed after two days. Patient left the hospital eight days after surgery. There was no recurrence of her hernia in the last five years.

Discussion

Looking at the two very similar cases of transiliac herniation following a structural bone graft harvest treated at our institution, we can appreciate that there are different surgical options available for this type of hernia repair. The main goals are to reduce the hernia and cover the deficit to avoid complications such as incarceration, strangulation or intestinal occlusion [13,18]. The Alexandre's approach was used for the first case. This technique consists of fixing a mesh to the muscles around the deficit and to the periosteum of the iliac crest [21-26]. Many authors recommend the use of a synthetic mesh [10,23,27]. An innovative technique was performed for the second case to try to avoid possible recurrences. This technique consists of inserting a corkscrew anchor at the inferior border of the iliac bone defect. The anchor's sutures are then pass through the mesh to securely fix it to the iliac crest [16]. This keeps the mesh firmly in place by its rigid fixation through the bone with the anchor. The mesh can barely moves and keeps the deficit covered. It is our opinion that this decreases the risk of recurrent herniation. Moreover, the laparoscopic technique has the advantages of less pain and morbidity in the post-operative period, a shorter hospital stay and ease in the localization of the deficit [19,26]. However, minimally invasive surgery is technically more challenging and requires more operative time. The clinical presentation of an iliac hernia is the presence of a mass at the harvest site [19] that is usually sensitive and easily reducible. The mass can become more prominent with standing, walking or coughing. Occasionally, the patient can present with signs of intestinal occlusion such as abdominal pain and vomiting. This complication can occur between 24 days and 15 years [21,22] after the bone graft harvest. In our cases, the hernia appeared five months and 24 years after the initial surgery. Some risk factors were described for transiliac herniation, namely age, female sex, a high BMI, poor abdominal muscles, a full thickness bone graft harvest, a deficit of more than 4 cm^2 and chronic obstructive pulmonary disease [8,18,23]. CT scan is the imaging modality of choice to confirm the diagnosis. Indeed, CT scan images can show the osseous deficit, the hernia and its content as well as hernia's immediate relations and fascial plans involved [14,19,24]. CT scan might also be useful to confirm the hernia repair after surgery and minimize risk of recurrence [15,25]. Traditional x-rays show the osseous deficit but not the hernia. As for ultrasounds, this modality is inexpensive and safe but has some limitations, especially when the patient is obese. It is also difficult to identify other concomitant abdominal pathologies [20].

Conclusion

In conclusion, the use of a corkscrew anchor to fix the mesh rigidly through the iliac bone seems to offer a fast recovery with minimal complications compared to the standard technique where the mesh is loosely fix to the adjacent muscles. This hernia repair technique seems to offer better results and less recurrence. A study comparing the two techniques with more patients involved would help confirm our findings.

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