Incisional hernia secondary to iliac crest graft extraction: Transosseous repair with polypropylene mesh

Mar De Castro, Elena Larraz, Sonia Morales Artero, Carlos Zorzo, Montserrat Calvo, Ramón Díaz

**ABSTRACT**

**Introduction:** Incisional hernias due to iliac crest graft extraction are very rare. Some authors incorrectly classify them as lumbar hernias. Case Report: We present a case diagnosed after clinical suspicion and computed tomography (CT) imaging. Surgical repair was carried out through an open extraperitoneal approach with two polypropylene meshes, one of them fixed through the iliac bone. Conclusion: Transiliac hernias are difficult to repair, as the hernia ring is within the bone. We consider that the reparation described is extremely secure and may avoid recurrence.

**Keywords:** Incisional hernia, Polypropylene mesh, Transiliac hernia

---

**INTRODUCTION**

Hernias secondary to iliac crest graft are rare. Their incidence is somewhere between 5% and 9% [1]. Some papers describe them as lumbar hernias [2, 3]. Others simply consider them incisional abdominal hernias that appear as a complication of iliac crest graft extraction [4]; so did Oldfield [5], the first author to publish a case reporting this type of hernia.

**CASE REPORT**

A 56-year-old woman with history of bone graft extraction from the left iliac crest was presented. One year later, a mass appears beneath the scar; it grows during effort and standing, but declines in supine position (Figure 1). No local symptoms or incarceration is described. The lab tests performed were normal. Plain radiographs show a bony defect in the iliac crest, above which gas appears (Figure 2A). On CT, intestinal loops are seen coming out from the abdomen, finding the iliac crest on one side and soft tissue on the other, what sustains the diagnose of an abdominal hernia (Figure 2B). The patient is operated under general anesthesia in a right lateral position. An incision is made removing the scar and widely dissecting the hernia sac down to its origin. The lower rim of the defect was iliac bone, the superior rim abdominal muscle (Figure 3A).

When opening the sac, intestinal loops without adhesions were found, the hernia ring measured about $3 \times 5$ cm. Contents were reduced inside the abdominal cavity and the peritoneal sac was closed with a running polydioxanone 2/0 suture. In order to repair the hernia, the bony defect was dissected with a periosteotome. Several holes were drilled in the bone 1.5 cm away from the rim of the defect with 2.5 mm Kirschner wires (Figure 3B, C). Next, a polypropylene $10 \times 10$ high density polypropylene prosthesis was fixed with polypropylene...
1/0 sutures that passed through the holes in the iliac bone, so the mesh was securely applied to the bone (Figure 3D).

On the other side of the hernia defect the prostheses were fixed to the edges of the transverse and minor oblique muscles (Figure 3E). A second polypropylene mesh similar in size was applied in an outer layer, anchored to the periosteum of the iliac bone and to the mayor oblique muscle’s fascia (Figure 3F). A suction drain was left over the outer mesh. The skin was closed with a 2/0 polypropylene suture. Postoperative period was uneventful, the patient was discharged six days after the operation. On follow-up two years later she remains asymptomatic and with no recurrence (Figure 4).

DISCUSSION

Among the complications that patients undergoing iliac crest bone harvesting for grafts may have hernias emerging through the defect created between the iliac bone and the muscles inserted on it can be found. They must therefore be considered as true incisional hernias [5, 6] rather than lumbar hernias, although their location corresponds with an anatomical site known as Petit triangle, where lumbar congenital hernias occur. These hernias are usually asymptomatic, being pain the most relevant symptom when they occur. Incarceration and/or strangulation is extremely rare [7–10]. Past history of iliac bone graft harvesting and the finding of a mass beneath the scar that grows during effort and standing reinforces clinical suspicion of an incisional hernia. Among imaging tests, CT scan with intravenous (IV) contrast allows the identification of the hernia volume and its contents, and is useful to measure the size of the hernia ring. In our case, small intestine was found inside the hernia, although there are cases in literature that describe other organs (colon, kidney) inside the hernia sac [11, 12].

Surgical treatment may be accomplished with an open approach, dissecting the hernia sac and exploring its contents. After reduction, the peritoneum is closed and the hernia defect must be repaired. This can be difficult to achieve, as one of its edges is bony. In order to accomplish an optimal repair, the prosthesis chosen has to be adequately fixed. Some authors [2] have used a “corkscrew anchor” to fix the mesh to the bone. Another open approach is the preperitoneal one, described by Carbonell et al. [3], who fix the mesh with “bone anchors.”

In our case, we chose an open extraperitoneal approach. Fixation was achieved by drilling several holes in the iliac bone with a Kirschner needle and passing several polypropylene suture threads through them, with which we anchored a polypropylene mesh. This technique provided us a solid fixation of the prostheses to the bony side, where recurrences are more common. We consider this prosthetic material the ideal to achieve a good tissue integration. The use of a double mesh reinforces the repair in a difficult site, as is the bony rim of the iliac crest.

Figure 1: Incisional hernia due to iliac crest graft extraction.

Figure 2: (A) Plain radiographs show gas above a bony defect in the iliac crest. (B) CT image: intestinal loops inside the hernia sac.

Figure 3: (A) Dissection of hernia sac. (B) Several holes drilled in the bone with Kirschner wires. (C) Polypropylene sutures passed through the holes in the iliac crest. (D) Mesh placed on the rim of the iliac crest. (E) Fixation of the mesh to the edges of the muscle’s fascia. (F) Suture the mayor oblique muscle’s fascia.

Figure 4: View of the lateral aspect of the abdomen one year after the surgery.
Laparoscopic approaches have also been described to repair this kind of hernias [13–15]. Fixation procedures used include mainly socalled tails.

Iliac crest hernias may be avoided if the defect created by bone harvesting is adequately closed. In some cases, it is recommended to harvest only the bone, leaving the periosteum behind, which can be used to close the defect. Although there are still no papers published regarding the subject, in obese patients with a higher risk of developing incisional hernias, the use of a prophylactic polypropylene mesh could be a solution to avoid their occurrence.

CONCLUSION

Incisional hernias that are close to bony rims present technical problems at the time of repair. We have chosen transosseous fixation for our polypropylene meshes, what provided us an excellent result.

REFERENCES


**********

Author Contributions

Mar De Castro – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Elena Larraz – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Sonia Morales Artero – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Carlos Zorzo – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Montserrat Calvo – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Ramón Díaz – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

**********
aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission
The corresponding author is the guarantor of submission.

Source of Support
None.

Consent Statement
Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest
Authors declare no conflict of interest.

Data Availability
All relevant data are within the paper and its Supporting Information files.

Copyright
© 2019 Mar De Castro et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.
Submit your manuscripts at
www.edoriumjournals.com