

# Lumbar Incisional Hernia Repair After Iliac Crest Bone Graft

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## ABSTRACT

The iliac crest is a common donor site for autogenous bone grafts. Among the reported complications, lumbar hernias occur infrequently with a reported incidence of 5% to 9%. Surgical repair is advocated secondary to the risk of incarceration or strangulation. Computed tomography is the diagnostic study of choice. Various transabdominal, retroperitoneal, and laparoscopic approaches have been described for the repair of lumbar hernias. We describe a case of successful lumbar incisional hernia repair after iliac crest bone graft harvesting that used prosthetic mesh.

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## INTRODUCTION

The iliac crest is a common donor site for autogenous bone grafts. Reported complications include arterial injury, nerve injury, ureteral injury, ileus, hematoma, pelvic instability, fracture, and herniation.<sup>1</sup> Lumbar hernias are anatomically bound by the 12th rib superiorly, the iliac crest inferiorly, the erector spinae muscle medially, and the external oblique muscle laterally. The incidence of lumbar hernia after iliac crest bone graft harvesting is estimated to be 5% to 9%.<sup>2,3</sup> Surgery is recommended secondary to the 25% risk of incarceration and 10% risk of strangulation with lumbar hernias.<sup>4</sup> We present a case of lumbar incisional hernia repair using prosthetic mesh.

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## CASE REPORT

A 61-year-old female with a medical history significant for hypertension, dyslipidemia, and hypothyroidism underwent cervical fusion requiring right iliac crest bone graft harvesting to repair an odontoid fracture after a motor vehicle accident. She presented to our clinic approximately 1.5 years later with a week-long history of painful swelling along her right flank. On examination, a moderately sized, reducible bulge was palpated just under the graft harvest scar along the right iliac crest. Computed tomography (CT) confirmed a large right lumbar hernia containing fat and a portion of colon located below the 12th rib and above the iliac crest without evidence of bowel obstruction (Figure).

We performed an open lumbar incisional hernia repair with polypropylene mesh. The defect measured 5 cm × 7.5 cm and contained omentum and colon, which were easily reduced. The mesh was sutured to the surrounding abdominal fascia on the medial, lateral, and superior edges and to the iliac crest periosteum along the inferior edge using 4 running 0 GORE-TEX (W. L. Gore & Associates, Flagstaff, AZ) sutures. A drain was left in the subcutaneous space. Postoperative recovery was uneventful. Follow-up at 6 weeks demonstrated no hernia recurrence.

## DISCUSSION

Lumbar hernias are rare with approximately 300 cases described in the literature.<sup>5</sup> They are more frequently seen in females, with onset of symptoms ranging from 24 days to 15 years after bone harvest.<sup>6</sup> Our patient noticed symptoms 1.5 years postoperatively.

Initial symptoms include development of a soft-tissue mass associated with discomfort. Examination may reveal bowel sounds on auscultation over the hernia.<sup>6</sup> Signs of bowel obstruction may be present if incarceration or strangulation is involved. Diagnosis is confirmed with CT, which can delineate the anatomy and hernia sac contents.<sup>7</sup>

Lumbar hernias are bound by the following anatomical landmarks: superiorly by the inferior border of the 12th rib, inferiorly by the iliac crest, medially by the lumbar spinous processes and muscles, and laterally by the external oblique muscle. These defects are thought to occur via two areas of weakness: the superior (Grynfeltt) and inferior (Jean Louis Petit)



**Figure. Right lumbar hernia containing omentum and colon.**

lumbar triangles. The superior lumbar triangle is bound superiorly by the 12th rib, lumbocostal ligament, and serratus posterior inferior muscle; laterally by the internal oblique muscle; and medially by the erector spinae muscle. The inferior lumbar triangle is bound inferiorly by the iliac crest, laterally by the external oblique muscle, and medially by the latissimus dorsi muscle. Lumbar hernias are thought to pass through either or both of these triangles.<sup>7</sup> Our patient had an inferior lumbar triangle hernia.

Several methods can be used to repair lumbar hernias, including bone transfer and various soft tissue flaps. The Bosworth repair involves transferring the anterior superior iliac spine inferiorly and posteriorly, drawing muscle and fascia over the defect.<sup>8</sup> The Dowd technique involves the use of a pedunculated gluteal fascia flap to cover the defect.<sup>9</sup> The Koontz technique utilizes a lumbar fascia flap for repair.<sup>9</sup> More recently, repair with synthetic mesh has been advocated.<sup>2</sup> Variations include the use of suture bone anchors or corkscrew anchors to facilitate mesh fixation to the iliac crest.<sup>10,11</sup> Laparoscopic approaches have been promoted as providing excellent visualization with the benefits of minimally invasive surgery.<sup>5,12</sup> Single incision endoscopic surgery has even been described as having favorable results.<sup>13</sup>

## CONCLUSION

We describe a case of lumbar hernia repaired utilizing a traditional method of tension-free mesh repair. Defining the hernia borders and ensuring adequate mesh fixation is of critical importance, especially along the iliac crest. Periosteal fixation should be incorporated, either through suture placement, bone anchors, or spiral tacks. We believe this technique is a simple and effective method to repair lumbar hernias.

## REFERENCES

1. Fowler BL, Dall BE, Rowe DE. Complications associated with harvesting autogenous iliac bone graft. *Am J Orthop (Belle Mead NJ)*. 1995 Dec;24(12):895-903.
2. Auleda J, Bianchi A, Tibau R, Rodriguez-Cano O. Hernia through iliac crest defects. A report of four cases. *Int Orthop*. 1995;19(6):367-369.
3. Forrest C, Boyd B, Manktelow R, Zuker R, Bowen V. The free vascularised iliac crest tissue transfer: donor site complications associated with eighty-two cases. *Br J Plast Surg*. 1992 Feb-Mar; 45(2):89-93.
4. Woodward AM, Flint LM, Ferrara JJ. Laparoscopic retroperitoneal repair of recurrent postoperative lumbar hernia. *J Laparoendosc Adv Surg Tech A*. 1999 Apr;9(2):181-186.
5. Sakarya A, Aydede H, Erhan MY, Kara E, Ilkgul O, Yavuz C. Laparoscopic repair of acquired lumbar hernia. *Surg Endosc*. 2003 Sep;17(9):1494. Epub 2003 Jul 10.
6. Velchuru VR, Satish SG, Petri GJ, Sturzaker HG. Hernia through an iliac crest bone graft site: report of a case and review of the literature. *Bull Hosp Jt Dis*. 2006;63(3-4):166-168.
7. Guilllem P, Czarnecki E, Duval G, Bounoua F, Fontaine C. Lumbar hernia: anatomical route assessed by computed tomography. *Surg Radiol Anat*. 2002 Feb;24(1):53-56.
8. Bosworth DM. Repair of herniae through iliac-crest defects. *J Bone Joint Surg Am*. 1955 Oct;37-A(5):1069-1073.
9. Di Carlo I, Toro A, Sparatore F, Corsale G. Lumbar hernia repaired using a new technique. *Am Surg*. 2007 Jan;73(1):54-57.
10. Carbonell AM, Kercher KW, Sigmon L, et al. A novel technique of lumbar hernia repair using bone anchor fixation. *Hernia*. 2005 Mar;9(1):22-25. Epub 2004 Sep 10.
11. Patten LC, Awad SS, Berger DH, Fagan SP. A novel technique for the repair of lumbar hernias after iliac crest bone harvest. *Am J Surg*. 2004 Jul;188(1):85-88.
12. Yurcisin BM, Myers CJ, Stahlfeld KR, Means JR. Laparoscopic hernia repair following iliac crest harvest. *Hernia*. 2010 Feb;14(1):93-96. Epub 2009 Apr 15.
13. Kawaguchi M, Ishikawa N, Shimizu S, Shin H, Matsunoki A, Watanabe G. Single incision endoscopic surgery for lumbar hernia. *Minim Invasive Ther Allied Technol*. 2011 Jan;20(1):62-64. Epub 2010 Oct 14.

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