

# Incisional Hernia Secondary to Iliac Crest Bone Graft: A Rare Case Report and Review of Literature

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## Learning Point of the Article:

Full thickness iliac graft should be avoided as inner table of the iliac crest gives attachment to the fascial layers and abdominal muscle aponeurosis.

## Abstract

**Introduction:** Autologous bone graft is a commonly used procedure in orthopaedic surgery. Autologous bone is used to promote bone healing in fractures and to provide structural support for reconstructive surgery. Iliac bone is one of the common sites for harvesting autologous bone graft. Hernia through an iliac crest defect following bone graft harvesting is a major but very rare complication.

**Case Report:** An 80-year-old female patient operated for left subtrochanteric femur fracture with dynamic condylar screw and iliac bone graft. Ten months after the surgery, the patient came with the complaints of reducible swelling in the left flank over the incision site. On the basis of clinical examination and investigations, the swelling was diagnosed as an incisional hernia from the defect in the iliac bone graft site.

**Conclusion:** Hernia through an iliac crest defect following bone graft harvesting is very rare but a major complication. Attention should be paid while harvesting bone graft to avoid this complication.

**Keywords:** Complications, incisional hernia, iliac crest graft.

## Introduction

Bone graft is common adjunct procedure in orthopaedic surgery used for fusion, fracture repair, and the reconstruction of skeletal defects. Autologous bone graft or autograft involves the transport of bone from a donor site to another location in the same patient. The advantages of autologous bone include its osteoinductive and osteoconductive properties [1].

Although autologous bone grafts have excellent biological and mechanical properties, considerable donor site morbidity and limited volume availability are main limitations. The most common source for an autologous bone graft is the iliac crest. It may be harvested from the anterior or the posterior iliac crest. The most common complications are arterial injury, nerve injury, ureteral injury, ileus, haematoma, pelvic instability, and fracture. Hernia through an iliac crest defect following bone graft harvesting is a major but very rare complication [2].

## Case Report

An 80-year-old female operated for a left subtrochanteric femur fracture. The fracture fixation was done with a dynamic condylar screw (DCS) and left iliac crest bone graft. After 10 months of surgery, the patient came to the orthopaedic outpatient department with complaints of swelling in the left flank region for 1 month (Fig. 1).

On examination, she had a soft reducible swelling over the incision site, which increased during coughing and standing and reduced while lying down. Swelling was non-pulsatile, increased with cough impulse (Fig. 2a, b), and no other swelling was present anywhere else in the body. There was an evidence of bowel herniation lateral to the left iliac crest. X-ray of pelvis showed a large, full-thickness defect of the left iliac crest bone grafting site (Fig. 3).

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## Author's Photo Gallery



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**Figure 1:** Image showing the hernia bulge at the incision site.



**Figure 2:** (a) Photograph showing the left iliac fossa with healed surgical scar over the bone graft site. With the patient in supine position, the swelling disappears.



**Figure 2:** (b) Photograph showing increase in the size of swelling with cough impulse.



**Figure 3:** X-ray of the left-sided pelvis showing full-thickness bone graft defect in the iliac crest.

We informed about the operative treatment procedure and hernia complications such as incarceration or strangulation, but she was not ready for another surgery. Informed consent was taken and advised regular follow-up.

### Discussion

Iliac crest is the most common site to obtain autologous bone graft. It is an excellent source of both cortical and cancellous bone. Complications associated with bone grafting are damage to arteries (superior gluteal, fourth lumbar, iliolumbar, and deep circumflex iliac), damage to nerves (lateral femoral, ilioinguinal), ureteral injury, gastrointestinal hernia, ileus, hematoma, pelvic instability, and fractures. Gastrointestinal herniation through the wing of the ilium after grafting is an extremely rare complication [2, 3]. Overall incidence varies between 5% and 9% [3].

The occurrence of a “land slide” hernia of caecum through iliac crest bone defect was first reported by Oldfield in 1945 [4]. They are more frequently seen in females, with the onset of symptoms ranging from 24 days to 15 years after bone harvest. Predisposing factors of this condition are age more than 65 years, obese patients with poor musculature, increased abdominal pressure, hypertension, and harvesting of a full-thickness graft, especially from the middle portion of the iliac crest [3]. These hernias are usually asymptomatic; pain is the most relevant symptom when they occur. Incarceration and/or strangulation are extremely rare.

Among imaging tests, Plain radiographs will show the bony defect in the ilium and CT scan with intravenous contrast allows the identification of the hernia volume and its contents and is useful to measure the size of the hernia ring [5]. Hernia is treated with a reduction of the hernia and obliteration of the defect with tension-free mesh repair. It can be performed

through a laparoscopic, retroperitoneal, or trans abdominal approach as per the surgeon's choice and the patient's clinical condition [3].

Three main treatment possibilities are the advancement of various soft tissues such as the abdominal fascia, abdominal muscle, iliac muscle, and tensor fascia lata and imbrication to bridge the fibro-osseous gap [6]. To change the profile of the involved iliac crest and remove the notch transposition of the anterior superior iliac spine to a more distal and posterior position is performed, so that muscular, ligamentous and fascial structures can be held tightly across the defect [7]. Especially if the defect is >4 cm, closure of the defect done with prosthetic mesh or bone allografts [8]. To avoid this complication, bicortical bone grafts should be preferred. Preservation of the inner table of the iliac crest and secure reattachment of fascial layers and tendons is recommended [9]. Other techniques, such as bone substitutes and cell therapy, can also be considered for bony reconstruction.

### Conclusion

Hernia through an iliac crest defect following bone graft harvesting is a very rare but a major complication. Attention should be paid while harvesting bone graft to avoid this complication. Surgical interventions are required to prevent further hernia related complications.

### Clinical Message

The bone graft harvesting procedure must be optimum otherwise use artificial bone graft/substitutes. Early suspicion and diagnosis of incisional hernia should be done in cases of previous history iliac crest bone graft patients to prevent further complications related to hernia.

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