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Case Report

Heterotopic ossification – A rare donor site complication after iliac crest free flap

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ABSTRACT

Iliac crest free flap is still essential as a source of vascularized bone tissue, having a definite role in osseous reconstruction of the face and other small bone defects. Some of its drawbacks include laborious dissection and donor site morbidity. We report a case of a patient that presented to our follow-up consultation ten years after iliac crest free flap harvest with new complaints of pain, gait disturbance and swelling in the right hip. Imaging exams revealed a heterotopic bone formation and helped with the diagnosis of heterotopic ossification (HO) of the right iliacus bone. Surgical intervention was needed for debridement of the heterotopic bone, with resolution of the symptoms. To our knowledge, this is the first report of HO after iliac crest free flap harvest. This rare condition adds to an already well-known number of donor zone complications of this flap. Plastic surgeons should be aware of this complication, as it can cause disability many years after the original surgery.

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Introduction

Iliac crest is well accepted as a good source of bone, either as non-vascularized bone grafts or as a vascularized free tissue transfer. Innumerable applications have been described for iliac crest free flap. In addition to its definite role in osseous reconstruction of the face (for both maxillary and mandibular reconstruction), it can also be used in upper and lower extremity small bone defects.¹ As a free flap, it provides a good depth and width of bone and a natural curvature that makes it very suitable for head and neck reconstruction. Donor site morbidity is one of the main drawbacks of its use limiting its application nowadays. Complications are well described in literature and include chronic pain, abdominal hernias, abdominal hip contour, gait disturbance, among others.^{2,3}

We present a case report of a never described donor site complication, a heterotopic ossification of the right iliacus bone after iliac crest free flap harvesting for mandibular reconstruction.

Case presentation

A 20-year-old patient diagnosed with ameloblastoma of the right mandibula was referred to our clinic for surgical treatment. The patient was submitted to right hemimandibulectomy with condyle preservation. Reconstruction was performed with right iliac crest free flap, with arterial and venous anastomosis made to the facial artery and external jugular vein. The immediate postoperative period was uneventful. A temporary neurosensory disturbance with hypoesthesia of the anterior right thigh was noted, with complete resolution after six months. Functional outcomes were considered ideal, with oral rehabilitation made with dental implants, allowing unrestricted diet and normal speech.

At 10 years post operative, the patient returned to our consultation with complaints of pain in the right hip *de novo* and associated gait disturbance. At physical observation, a new swelling in the location of the anterior-superior iliac spine was noted. A pelvic computed tomography (CT) scan showed a dysmorphic right iliac crest, with a heterotopic ossification (32 × 57 mm) surrounding the anterior-superior iliac spine (Figure 1). Surgical debridement of the ectopic bone was proposed after multidisciplinary discussion with orthopedics. The patient was submitted to surgical debridement of the heterotopic bone, without any intercurrent. In the postoperative period, the patient initiated a motor rehabilitation program, with increasing improvement on pain, gait and quality-of-life. She will maintain regular follow-up consultations in our center.

Discussion

Free tissue transfer of the iliac crest pedicled on the deep circumflex iliac vessels was first described by Taylor et al. in 1979.⁴ Up to this day, it is still considered the best alternative for hemimandible reconstruction, curved bones (such as pelvis, carpus and metacarpus) and short, straight

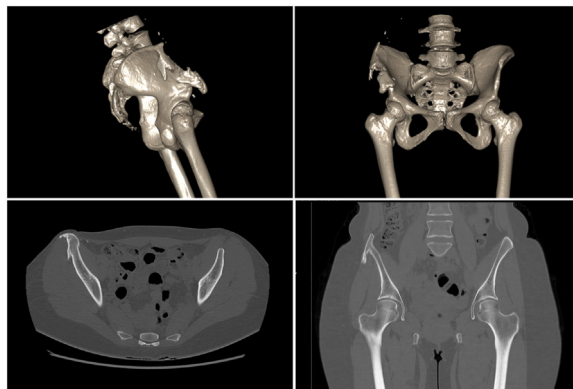


Figure 1. Pelvic computed tomography scan showing heterotopic ossification (32 × 57 mm) of the right iliacus bone.

bone defects.⁵ Apart from the tedious dissection that can be overcome by an experienced surgeon, this flap main drawback is still its donor site morbidity. While Urken et al.⁶ reported it to be minimal after more than 1 year of follow-up in 20 patients, some still consider it to be more significant when compared to other free vascularized bone transfer, such as the fibula free flap.⁷ We previously conducted a retrospective study to evaluate the iliac crest free flap donor site morbidity at our center. Several complications were described: hematoma, infection, chronic pain, permanent hypoesthesia of the lateral femoral cutaneous nerve, abdominal bulge/hernia and gait dysfunction.³ Other specific bone related complications have been reported, including contour deformities and anterior-superior iliac spine fractures.⁸ As for our knowledge, heterotopic ossification (HO) of the iliac bone after iliac crest bone flap harvesting have never been previously described in the literature.

HO is defined as the formation of extra skeletal bone in muscle and other soft tissues. The non-genetic form typically presents in young adults with a history of local trauma or surgery. Tissue injury is followed by an influx of inflammatory cells and a downstream of signaling events, activating an osteogenic or osteochondrogenic response. Clinically, it manifests as localized pain, tenderness and swelling. The appearance of HO in CT scans is usually characteristic and helps in the diagnosis. Regarding the treatment strategies, physical therapy can help improve range of motion and contractures. Complete excision of the heterotopic bone through surgery is reserved for patients with significant disability.⁹

Sporadic cases of HO around iliac bone has been described after harvest of small fragments of bone for its use as a graft.¹⁰ However, reports of HO of the iliacus bone following iliac crest free flap harvesting as previously described in this work is lacking in literature. Even though its benign nature, HO can cause serious discomfort for the patient (pain, gait disturbance, swelling) and lead to a new surgical intervention years after the primary surgery.

Conclusion

Iliac crest flap remains one of the workhorse flaps for osseous reconstruction, especially in head and neck. However, its morbidity should not be underestimated. Even though rare, HO may occur in consequence of local trauma to adjacent tissues plastic surgeons should be aware of this possible complication, as it can cause disability many years after the initial surgery.

Declaration of Competing Interest

The authors have no conflict interests to disclose.

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Consent and ethical approval

Informed consent was obtained from the patients for publication of this report and the accompanying images. No ethical approval was required for this study.

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