

Traumatic Abdominal Wall Hernia Repair with Dermal Autograft within a Morel-Lavallée Lesion

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Summary: Morel-Lavallée lesions and traumatic abdominal wall hernias seldom present together and have no standardized guidelines for treatment. We present a unique case of a traumatic abdominal wall hernia present within a patient's abdominal Morel-Lavallée lesion, which was reduced and repaired with a dermal autograft. This is a novel approach to repairing a rare and unusual injury. The literature suggests that tension-free repairs with mesh should be used on delayed repairs of traumatic abdominal wall hernias. However, some advocate for primary repairs due to an up to 50% increased risk of wound infection in these injuries, even without the use of mesh. Although infection rates with the use of biologic mesh (acellular dermal matrices) in a contaminated field are lower than that of synthetic mesh, infections still occur and tend to be higher in repairs without mesh. The lack of foreign material and innate immunogenicity of the patient's own dermis may theoretically decrease the risk of infection compared with other commercially-available and biologically-derived products. The patient is a 47-year-old woman who was in a motor vehicle accident with prolonged extrication time. She was hospitalized for approximately 6 months due to extensive injuries, but had no further complications from her Morel-Lavallée lesion or repair of her traumatic abdominal wall hernia with her own dermis. (*Plast Reconstr Surg Glob Open* 2022;10:e4119; doi: 10.1097/GOX.0000000000004119; Published online 23 February 2022.)

Morel-Lavallée lesions (MLLs) occur when skin and subcutaneous tissues separate from underlying fascia after high-energy, blunt traumas or crush injuries. When the superficial soft tissues are divided from the fascia below, the shear injury damages perforating vessels, subsequently leading to creation of a potential space that can fill with fluid, blood, and fat.¹ The ensuing inflammatory reaction may cause capsule formation enveloping this fluid and debris, thereby allowing for confined slow growth of the lesion.² MLLs occur most commonly in the thigh over the greater trochanter and can be associated with pelvic or acetabular fractures.¹ In addition to the trunk, other reported sites include prepatellar, lumbar, and scapular regions.¹

Traumatic abdominal wall hernias (TAWH) consist of protrusions through disrupted musculature and fascia

with remaining intact skin, often occurring after blunt trauma.³ Approximately 140 cases have been published in the literature since the first reported case in 1906.⁴

The current case is unique due to the presence of a TAWH coexisting within an MLL, as well as the innovative use of a dermal autograft to repair the hernia. There are few reported cases of MLL-associated TAWHs in the literature, and likewise, a paucity of management or treatment options described.⁵

CASE

The patient is a 47-year-old woman who was involved in a motor vehicle collision with prolonged extrication time. Initial abdominal CT displayed an injury to the oblique abdominal musculature with a large hematoma within the subcutaneous fat of the lower abdominal wall. (See figure 1, Supplemental Digital Content 1, which shows the patient's initial CT chest/abdomen/pelvis with contrast upon presentation to our institution after motor vehicle collision. <http://links.lww.com/PRSGO/B939>.) The patient underwent multiple orthopedic procedures to address other injuries within the first 2 weeks of hospitalization. She then had

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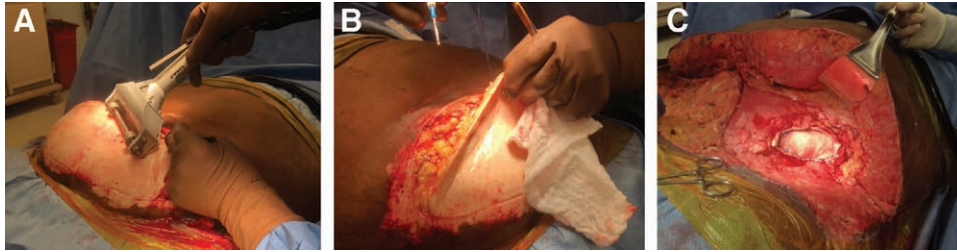


Fig. 1. Harvest of the dermal autograft and inset are depicted here. The patient's skin was de-epithelialized with a dermatome (A). The traumatic abdominal wall hernia was reduced (B), and the dermal autograft was sutured over the defect using PDS (C).

surgical debridement of a left lower-quadrant abdominal wound due to purulent drainage and fluctuance found on examination, resulting in the discovery of a large degloving wound that spanned across the patient's entire panniculus, and a diagnosis of an abdominal Morel-Lavallée lesion was made. The initial cutaneous wound measured 35×16 cm. Three days later, her abdominal incision was extended for further debridement as her injury continued to demarcate. The wound was then irrigated and debrided, with application of a negative-pressure dressing. Further debridement revealed a large, 45×21 cm, Morel-Lavallée lesion, containing a traumatic abdominal wall hernia with colonic protrusion. (See figure 1, Supplemental Digital Content 1, <http://links.lww.com/PRSGO/B939>.) (See figure 2, Supplemental Digital Content 2, which shows the patient's initial MLL. <http://links.lww.com/PRSGO/B940>.)

A large area of the panniculus was severely traumatized and therefore excised. A portion of this discarded panniculus was harvested as a dermal autograft to repair the TAWH. The dermal autograft was created by de-epithelializing the excised skin with a dermatome (Fig. 1).

The MLL was approached by mobilization of the lateral abdominal wall skin and subcutaneous tissue to close part of the abdominal defect directly. A rotational advancement flap was used to partially cover the central portion. A negative-pressure dressing was applied to the remaining open areas. The patient returned to the operating room several times for further debridement of skin, gradual closure, and negative-pressure dressing changes. A small area wound remained open that was allowed to heal by secondary intention (Fig. 2).

The patient had no further complications or hernia recurrence 6 months postoperatively. On clinical examination, she showed no symptoms or signs of hernia propagation or bowel strangulation.

DISCUSSION AND CONCLUSIONS

Due to the rarity of both abdominal MLLs and TAWHs, there are no standardized diagnostic or management guidelines. An algorithm for specifically greater trochanteric MLLs was developed by Singh et al, based on its commonalities with postoperative seromas, which includes sclerodosis, compression, or surgical drainage based on acuity and size of the lesion.⁶ The first case of an MLL-associated TAWH was reported by Shaban et al in 2019.⁵ However, the hernia was not repaired because the defect was too large with bowel contamination.

TAWHs are a rare subtype of hernia, resulting from blunt force trauma. Although they can be diagnosed radiologically or clinically by physical examination, their diagnosis is often overlooked. Additionally, their low prevalence is primarily why standardized management guidelines do not exist. According to Liasis et al, in cases where abdominal visceral injuries coexist with TAWHs, “the decision for a simultaneous hernia repair depends on the size of the orifice and the risk of incarceration; the presence of abdominal contamination and hollow viscus injuries; the ability to perform a tension-free primary repair; the requirement for use of the mesh; and the availability of the biologic meshes.”⁷ Ideally, a tension-free repair with mesh should be used for delayed treatment of TAWHs. The use of mesh in an emergent setting in the context of an initial laparotomy is more controversial due to concerns of infection.

Lane et al advocated for primary hernia repair due to an increased rate of wound infection even when mesh is not used.⁸ However, primary repair is not always possible



Fig. 2. Remaining area of wound (9×6 cm) left to heal by secondary intention approximately 2 months postoperatively.

due to domain loss, as in this patient. Synthetic mesh is not ideal due to increased risk of erosion, fistulation, and chronic infection.⁹ Although infection rates with use of biologic mesh in a contaminated field are lower than that of synthetic mesh, infection still occurs and tends to be higher than in repairs without mesh.⁸

The lack of foreign material and innate immunogenicity of the patient's own dermis would theoretically decrease the risk of an infection relative to the use of other commercially-available products. Dermal autografts have more frequently been used in breast reconstruction in lieu of acellular dermal matrices (ADM). When compared with ADM, dermal autografts have been shown to increase neovascularization in multiple studies, which theoretically decreases complications.¹⁰ To date (6-months postoperatively), the patient has had no further complications or symptoms of recurrence or infection.

In conclusion, we present a novel approach to successfully treat a patient's MLL-associated TAWH with a dermal autograft. Because of this successful treatment, we believe that a dermal autograft harvested from excess tissue can be a viable option instead of other synthetic or biologic meshes for TAWH repair.

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