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Surgical excision of perineal nodular induration: A cyclist's third testicle

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Abstract

Perineal nodular induration (PNI), or biker's nodule, is a rare, bothersome, pseudotumour. Herein, we describe the surgical technique used to treat a healthy cyclist who developed an enlarging PNI for five years that grew into a perineal mass. The mass prevented him from cycling due to worsening discomfort and heaviness. The PNI-associated mass was successfully removed by wide surgical excision and a local advancement flap. Subsequently, the patient resumed cycling. Histopathology report demonstrated a benign lesion with abundant ropy collagen with native smooth muscle, vessels, and rare fibroblast-like spindle cells. With the increasing popularity of cycling, PNI may become more common, and health providers should be aware of this rare entity and how it can be safely removed.

Introduction

Bicycle riding is one of the most popular methods for transportation, exercise, and leisure. According to U.S. Bicycling Participation Benchmarking 2015 report, 34% or 103.7 million Americans (ages three and older) rode a bicycle at least once in the past year, with 14% of this population reporting frequent riding more than 104 times/year.[1] The health benefits of bicycling as an aerobic exercise are well-known.[2-4] Endurance cycling may cause injuries affecting the genitourinary system.[5] Perineal nodular induration (PNI) also known as biker's nodule, cyclist's nodule, ischiatic hygroma, third testicle, or an accessory testicle is a benign pseudotumour that presents most commonly in avid male cyclists with repetitive perineal microtrauma.[6] It usually develops posterior to the scrotum in the soft tissue of the perineum, as two masses on both sides of the median raphe, or as a single mass located midline, or lateralized over the ischial tuberosity.[6] Herein, we report our surgical technique for PNI treatment and the histopathological characteristics of PNI.

History

A 48-year-old healthy male who is an avid cyclist presented with a progressive inferior perineal and scrotal swelling for five years. He had been actively cycling for 20 years, riding an average of 100 miles/week. When he presented to our clinic, he complained of redundant scrotal and perineal skin. He reported a history of saddle sores that resolved in the past. On physical examination, there was a large, mobile, non-tender, and soft mound of perineal tissue that was posterior to the scrotum with redundant tissue, covered by normal skin (Fig. 1). Ultrasound of the scrotum demonstrated redundant soft tissue in the perineum inferior to the raphe. The bulge restricted the patient's daily activity and he opted for surgical excision.

Surgical technique

The patient was placed in a lithotomy position. An elliptical incision was made from the apex, near the scrotum, down to 2 cm above the anus. The dissection was superior to the bulbospongiosus muscle. After complete mobilization, the mass was transected and sent to pathology. It measured approximately 14 x 5 cm (Fig. 2). In order to close the incision in a tension-free manner, lateral flaps were raised that were approximately 15 x 3 cm. The subcutaneous layers were closed using interrupted 2-0 vicryl for the deep and superificial layers. In total, there were four layers of closure. The patient tolerated the procedure well and was discharged in the same day in a good condition.

Pathology

Grossly, the specimen consisted of a 14 x 5.5 cm x 2 cm thick fragment of hair-bearing skin and subcutaneous tissue

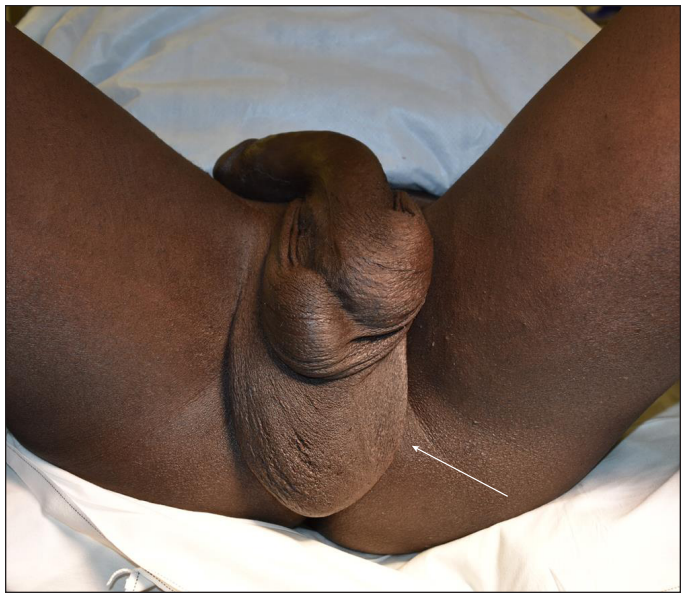

Fig. 1. Large, perineal fat posterior to the scrotum with redundant tissue resembling an accessory testicle (arrow).

with a homogeneous, fibrotic cut surface. The epidermis and dermis were unremarkable microscopically (not shown). The deeper soft tissues showed abundant ropy collagen bundles mixed with native smooth muscle, vessels, and rare fibroblast-like spindle cells. There was no atypia, necrosis, or mitotic activity (Fig. 3).

Followup

The patient began cycling roughly two months after the operation with mild discomfort that improved over time. He denied any sexual or urinary side effects. Fig. 4 shows the patient's perineum and scrotum in followup, with no signs of residual mass at two months' followup.

Fig. 2. Excised mass measuring approximately 14 x 5 cm.

Discussion

Although the pathogenesis of PNI is unknown, it may be related to the repetitive compression and friction of the perineal fascia between the bike's saddle and ischial tuberosities.[7] Beyond cyclists, this complication has been documented in a patient who was an equestrian and another who tested lawn mowers.[8,9] It is more commonly seen in males, but recently, five female cases have been reported.[9,10] Its latency period varies from a few weeks to one year. Although the nodule in our case was mobile, most reports state that it is fixed to the soft tissue or ischial tuberosity, has a fibrous to elastic consistency, and is covered by normal skin.[6,7,11]

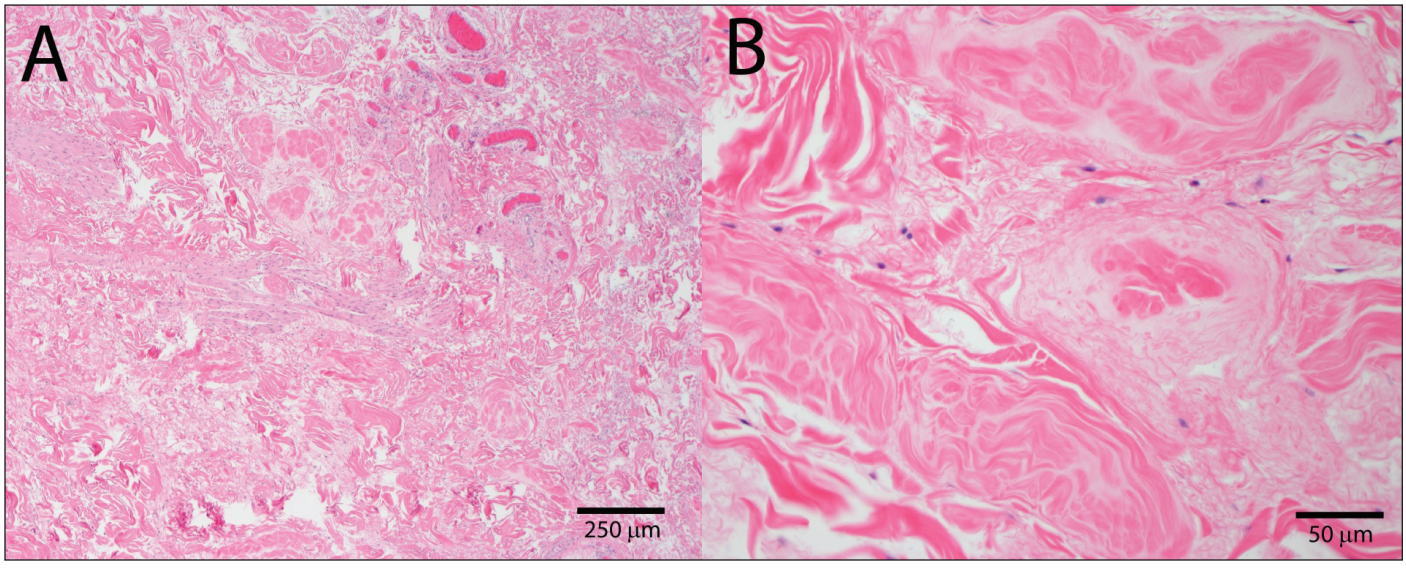

Fig. 3. (***A)*** Microscopically, the excision specimen demonstrated abundant ropy collagen with rare, bland fibroblast-like spindle cells mixed with native smooth muscle and small vessels; ***(B)*** at higher magnification, some of the collagen bundles showed a hyaline, keloidal quality.

Fig. 4. Patient perineum and scrotum at two months' followup showing no signs of residual mass.

The histopathological appearance of PNI varies. It is often characterized by a central pseudocystic space surrounded by fibrous tissue containing fibroblast spindle cells and clusters of small-sized vessels.[7,11,12] The central pseudocystic space somewhat resembles that seen in ischemic fasciitis, which occur in elderly patients over the bony prominences who are often, though not always, immobilized.[13-15] Other possible differential diagnoses are listed in Table 1.

In most cases, history and physical examination can diagnose PNI. Imaging modalities, such as ultrasound and magnetic resonance imaging, may be needed in some cases. Final diagnosis is made by histopathological examination. Primary treatment options include adjustment of cyclist position to change the distribution of weight on the saddle, as well as limiting the source of friction, which includes using adequate saddle/perineal lubricant and proper fitting cycling clothing. Patients can be counselled that there are no reports of spontaneous regression, but it is possible to limit progression and discomfort. Second, some authors reported that intralesional corticosteroids or hyalurodinase injection may offer some relief. These injections are only preferable for small nodules and may cause subcutaneous atrophy.[22,23] Both of the previous treatment options were not suitable for our patient, as the mass was quite large and bothersome. Finally, surgical excision of the mass is the most often used treatment with superior results.[6] The technique to remove this mass could vary depending on the exact size and location. With smaller masses, the need to raise local skin flaps as in our case, may not be necessary. For larger masses, if skin flaps cannot be mobilized well enough, a split-thickness skin graft could also be applied to any areas not able to be closed in a tension-free manner.

Conclusion

PNI is a poorly recognized, rare, bothersome benign pseudotumour that mostly appears in professional and avid cyclists. Diagnosis is made by clinical history and examination. Surgical excision is the treatment of choice. With the increasing popularity of cycling, PNI may become more common, and healthcare providers should be aware of this entity and how it can be safely removed.

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This paper has been peer-reviewed.

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Table 1. Differential diagnoses for perineal nodular induration

Differential diagnosis	Histolopathological features
Ischemic fasciitis[13-15]	Outer fringe of mitotically active fibroblasts and occasional ganglion-like cells and small vessels surrounding a central zone of necrobiosis
Cellular angofibrom*[16]	Uniformly moderately cellular with plump, bland spindle cells, hyalinized round, thick and walled vessels may contain adipose tissue
Angiomyofibroblastoma-like tumour of the male genital tract*[17]	Alternating hypercellular and hypocellular areas with clusters of rounded, epithelioid cells around numerous small vessels
Mammary type fibroblastoma*[18]	Well-circumscribed, more cellular, and lacks a central zone pattern. Bundles of thick, ropy collagen with inconspicuous vessels may contain adipose tissue
Massive localized lymphedema[19]	Edematous stroma, dilated vascular channels, and mature adipose tissue separated by fibrous septa
Prepuberal vulvar formation[20]	Poorly marginated, hypocellular tumours, formed by bland of spindle-shaped cells in a collagenous to edematous or myxoid stroma
Childhood asymmetric labium majus enlargement[21]	Rare to moderate cellular interconnected fibrous bands, encircled lobules of fat, vessels, and nerves

*These three entities are closely related and may represent variants of a single entity.

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