

Case Report

Intratendinous Gouty Tophus Mimics Patellar Tendonitis in an Athlete

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ABSTRACT: We describe the imaging and pathologic features of a case of intratendinous patellar gouty tophus incidentally discovered in a patient with knee pain. The possibility of intratendinous gouty tophus must be kept in mind by sports physicians, especially in the management of patellar tendinopathy in athletes. It may be associated with other injuries, such as enthesopathies or partial tendon tears. © 2012 Wiley Periodicals, Inc. *J Clin Ultrasound* 00:000–000, 2012; Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/jcu.21910

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Gout is an inflammatory metabolic disorder characterized by raised levels of uric acid in the blood. It consists of a deposition of monosodium urate crystals (MSU), mostly in the joints or soft tissues.¹ The onset of gout usually occurs between the ages of 30 and 50.² The male-to-female ratio is 9:1. Gout symptoms appear earlier in men, whereas in women they are rarely seen before menopause.

Tendons are often involved in various systemic diseases, such as gout, pseudo-gout, rheumatoid arthritis, and spondyloarthropathies.³ Achilles and patellar tendinitis are a relatively common clinical presentation of gout. Gout may lead to tendon rupture.⁴

Ultrasound (US) and MRI are useful tools to confirm the diagnosis of atypical intratendinous gout presentations. On US, tophi appear as clusters of hyperechoic, heterogeneous areas with poorly defined contours, surrounded by an anechoic halo.¹

We report a case of isolated intratendinous gouty tophi in a 42-year-old man recreational triathlete without any previous history or diagnosis of gout.

CASE REPORT

A 42-year-old male recreational triathlete with previous bilateral Osgood-Schlatter disease and a family history of hyperuricemia presented to the clinic with a 3-month history of left anterior knee pain.

The pain was localized over the patellar tendon, more so on palpation of the proximal third of the patellar tendon. US was performed in the first consultation using a Micromaxx Sonosite (Bothell, WA) with a 5–13 MHz linear probe with a comparison with the contralateral knee and the initial diagnosis was proximal patellar tendinitis (“jumper’s knee”). The rehabilitation treatment consisted of an eccentric strengthening exercise program to decrease the training load, especially running, allowing the patient to continue with the swim and bike training.

An MRI obtained 2 weeks later with a 1.5-Tesla MR scanner (GE Healthcare, Milwaukee, WI), with consecutive 3-mm sections, using

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T1- and T2-weighted pulse sequences, with and without fat suppression, showed typical enthesopathic changes with a thickened tendon insertion (Figure 1). A global thickening of the tendon was observed in the distal portion, with fiber disruption and edema at the tibial insertions. Tendon thickness was 9 mm.

A standard battery of blood tests was carried out. The only relevant abnormality observed was an increase in uric acid level to 416 $\mu\text{mol/L}$ (normal range, 178–506 $\mu\text{mol/L}$). Due to the familial history of hyperuricemia and because we were treating a tendinopathy, a rheumatology consultation was requested and the rheumatologist recommended diet modification and 6-month treatment with oral allopurinol.

The patient resumed his normal level of physical activity to bike and swim with mild discomfort.

However, 3 months later, he returned with an acute onset of sharp anterior knee pain associated with local heat, redness, and swelling, and severely limited range of motion in both flexion and extension.

A repeat US examination was performed with the same equipment as the one used initially, revealing a distal intratendinous node with an area of degeneration at the tibial insertion site noted on power Doppler imaging (Figure 2). The diagnosis was changed to partial distal patellar tendon rupture with possible intratendinous gout. Another blood work showed the uric acid level at 238 $\mu\text{mol/L}$.

One week after the repeat US examination, another MRI examination was performed, again showing thickening of the tendon with disruption and irregularity of the tendon substance and edema at the tibial insertion site. The tendon fibers seemed to be separated by a possible gouty deposit. The tendon thickness was now 16 mm (Figure 3).

At this stage, the patient was considered to have gouty tophus and a possible partial distal patellar tendon rupture. He was consequently prescribed complete rest, colchicine 2 mg/d for 3 months, and prednisone 10 mg/d for 1 week.

Soon after the MR examination, a US-guided biopsy of the intratendinous mass was carried out to confirm the diagnosis. One milliliter of pale pink fluid was aspirated. Papanicolaou staining revealed uric acid crystals without any atypical cell, thereby confirming the diagnosis of gouty tophus.

The patient was then advised to rest and was given lifelong medical treatment with allopurinol. Six months after the acute episode, once the



FIGURE 1. Sagittal T1-weighted MR image shows a global thickening of the distal patellar tendon, with disruption, contour irregularity, and edema at the tibial attachment site. Total tendon thickness is approximately 9 mm.

discomfort had subsided, he progressively resumed his sports activities.

Twelve months later, the patient was asymptomatic and could take on a full training load. A follow-up US is shown in Figure 4.

DISCUSSION

There are several reports of diagnosis and treatment of gouty tophus in tendons (especially hand flexor tendons).^{5–10} Gout can also present with sodium urate crystal deposits in joints, tendons, peripheral nerves, ears, elbows, and kidneys when production exceeds excretion.¹¹ This is typically considered peripheral arthritis. Extra-articular gout is less common.¹² To date, there is only one article in the literature that describes patellar intratendinous gouty tophi.¹³

Tenosynovitis is a very rare form of extra-articular gout.⁶ In this particular case, the fact that the patient was an athlete led to making a differential diagnosis of partial rupture of the distal patellar tendon, even in the absence of trauma.

The initial diagnosis was patellar tendinopathy. The treatment for patellar tendinopathy in athletes usually includes oral nonsteroidal anti-inflammatory medication and physiotherapy with eccentric exercises. Taking into account the hyperuricemia history, allopurinol treatment was

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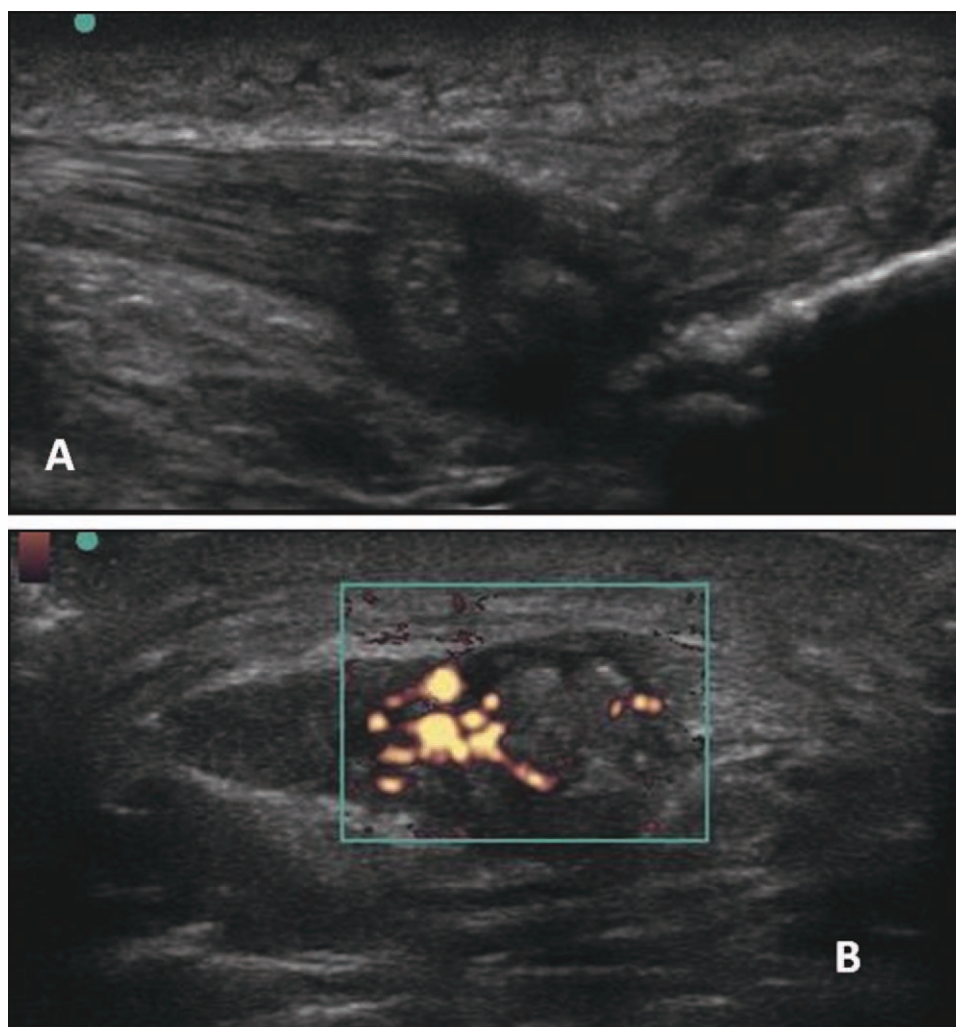


FIGURE 2. (A) Longitudinal sonogram of the distal part of the patellar tendon shows a heterogeneous intratendinous tophus with relatively well-defined contours, surrounded by a partial anechoic halo. (B) Marked vascularity can be observed on a transverse power Doppler sonogram.

added. The differential diagnosis was made when the patient presented with sharp pain with edema and inflammatory signs. Then, the good response to colchicine and prednisone treatment made us virtually certain of the gout diagnosis and the cytopathological examination confirmed it.

A normal uric acid level at the time of the acute crisis has been described in the literature.^{14,15}

The lack of experience in visualizing the ultrasonographic features of the gouty tophus is probably the reason for the delay in the diagnosis. There are now several US descriptions of gouty tophi in the literature: hyper- and hypoechoic areas with some shadowing,^{6,9,16,17} bulky hypoechoic heterogeneous material,¹⁸ and nodules of a nontransmitting echo-free density similar to bone,¹⁹ among others. De Ávila Fernandes et al recently concluded that US is a very useful diagnostic tool to assess intratendinous gout. They describe the appearance of gouty tophi as gener-

ally hyperechoic, heterogeneous, poorly defined masses, sometimes appearing as a cluster and surrounded by an anechoic halo.¹

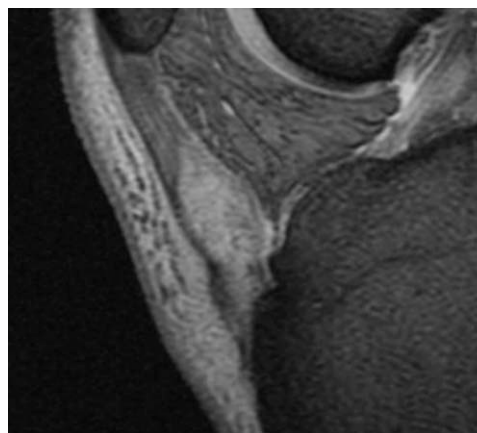


FIGURE 3. Sagittal T2-weighted MR image shows a global thickening of the distal patellar tendon, with disruption, contour irregularity, and edema at the tibial attachment site. An elongated pseudomass can be appreciated. Total tendon thickness is approximately 16 mm.

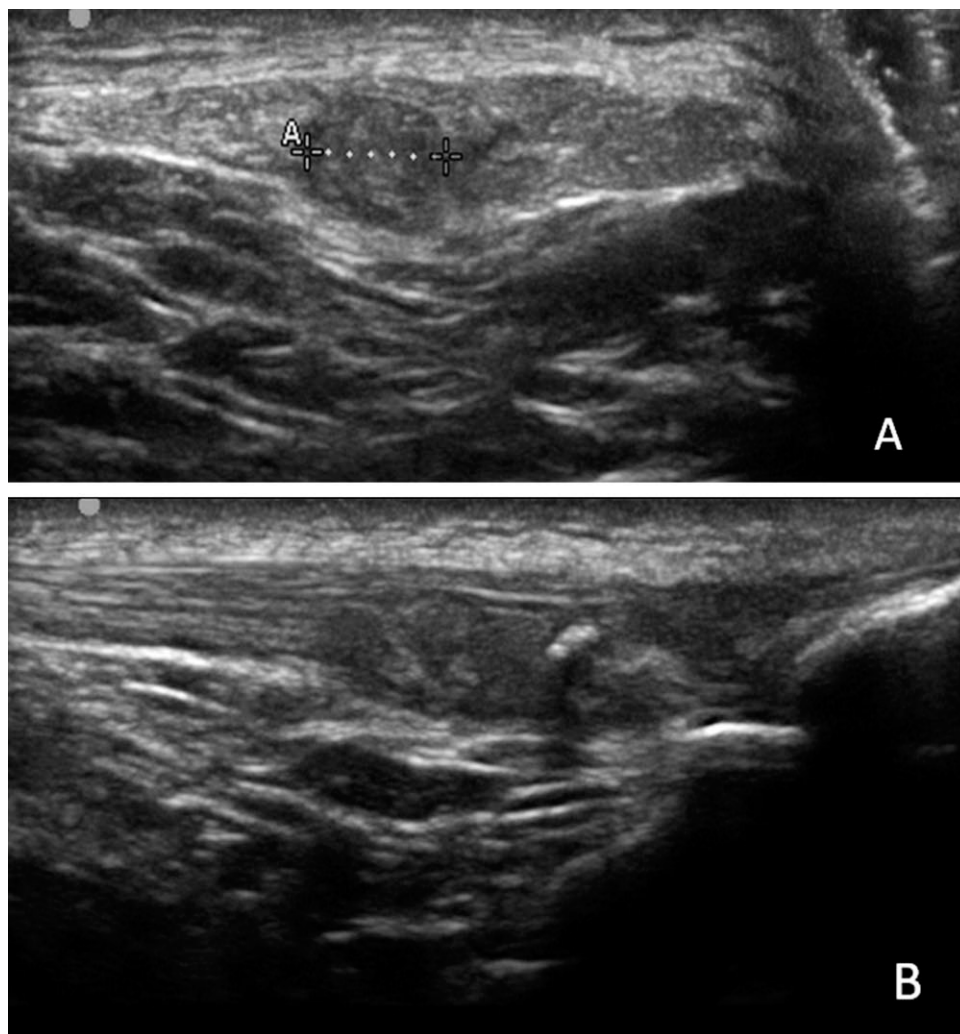


FIGURE 4. Follow-up sonogram in transverse (A) and longitudinal (B) planes shows a significant decrease in the size of the gouty tophus (calipers) compared with previous ultrasound study.

The gold standard for the diagnosis of gout is the presence of MSU crystals in aspirated joint fluid or directly from the tophic tissue. In recent years, US has been found capable of detecting MSU crystal deposits on cartilaginous surfaces as well as tophaceous material, thanks to its multiplanar imaging capabilities, high resolution, and dynamic assessment.²⁰ For Ptasznik,²¹ US is more sensitive to detect hyaline cartilage calcifications than conventional radiography.

MRI shows tophi as structures of intermediate- to low-signal intensity and is therefore useful to confirm the diagnosis. CT scans can also be useful to diagnose gouty tophi. Although US, MRI, and CT scans help in suspecting the diagnosis, only a cyto- or histopathological study can confirm the diagnosis.²²

It is interesting to note that despite a family history of hyperuricemia, this patient never had

an abnormally high uric acid level. Reports in the literature have indicated that it is possible to find a subclinical musculoskeletal involvement in asymptomatic individuals with raised uric acid levels.^{23,24}

The possibility of intratendinous gouty tophus must be kept in mind by the sports physician, especially in the management of patellar tendinopathies in athletes, and may be associated with other injuries such as enthesopathies or partial tendon tears. The association between long-distance running and gouty tophus in patients with hyperuricemia has also been described.²⁵

In conclusion, early diagnosis and prompt treatment are very important in sports medicine to allow an early return to athletic activity. Knowing the US characteristics of intratendinous gouty tophi is essential for early diagnosis. MRI can be used to confirm the diagnosis, if

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necessary. Treatment with rest, colchicine, non-steroidal anti-inflammatory drugs, and allopurinol significantly reduces the size of tophus and diminishes symptoms.

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