Magnetic resonance images of chronic patellar tendinitis

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Abstract. Chronic patellar tendinitis can be a frustrating diagnostic and therapeutic problem. This report evaluates seven tendons in five patients with chronic patellar tendinitis. The etiologies included "jumper's knee" and Osgood-Schlatter disease. In all cases magnetic resonance images (MRI) showed thickening of the tendon. Some of the tendons had focal areas of thickening which helped establish the etiology. All cases had intratendinous areas of increased signal which, in four cases, proved to be chronic tendon tears. MRI is useful in evaluating chronic patellar tendinitis because it establishes the diagnosis, detects associated chronic tears, and may help determine appropriate rehabilitation.

Key words: Magnetic resonance imaging – Chronic patellar tendinitis

As participation in athletic activities has grown, the incidence of certain tendinous injuries has increased [3, 6, 7, 9, 14]. The patellar tendon, the most inferior aspect of the quadriceps mechanism, becomes chronically inflamed when subjected to repeated injury. This injury may be associated with certain conditions such as "jumper's knee" [3] or Osgood-Schlatter disease [7]. These chronic patellar tendon injuries are a diagnostic and therapeutic problem that can be frustrating to the patient and the physician.

Before high resolution ultrasound, the most common diagnostic studies were invasive. High resolution sonography has a proven ability to detect abnormalities of superficial tendons [5], but its limited soft tissue contrast and operator dependence have prevented widespread use.

Recent studies have shown that magnetic resonance imaging (MRI) of the knee, using surface coils, provides superior soft tissue resolution [2, 4, 8, 11-13, 15]. In addition, its multplanar imaging capability makes it more useful than other diagnostic modalities for evaluating tendon pathology [1]. There have been reports in the literature describing the MRI appearance of acute patellar tendon injuries [4, 12]. This study reports our experience with MRI of chronic tendinous injuries. In four of our cases, surgical results are correlated with the MRI findings.

Material and methods

All images were obtained with a 1.5T superconductive MR unit (Signa, GE Corp., Milwaukee, WI) using a 256 x 256 matrix with a 12 or 16 cm field of view. Using a dedicated receive-transmit extremity coil, relatively T-1 weighted images (TIWI) (TR 800 ms; TE 20 ms) in the sagittal plane and spin density (SE 2000/20) and relatively T-2 weighted images (T2WI) (SE 2000/70) in the sagittal and axial planes were obtained. One excitation was used. Three millimeter thick sections with skip intervals of 0.6 mm were obtained through the patellar tendon. Imaging time was approximately 21.5 min.

Seven chronically painful patellar tendons in five patients are included in this study. All the patients were diagnosed as having chronic tendinitis with probable chronic partial tears. Four patients, two with bilateral disease, were young males involved in competitive athletics diagnosed as having "jumper's disease." Two of the patients played basketball, one played volleyball, and one played handball. One of the basketball players had an underlying history of Osgood-Schlatter disease. Three of the patients had surgery within 1 week of the MRI. Two were resections of the abnormal tendon regions, and the other was debridement and exploration of the patellar tendon. Imaging time was approximately 21.5 min.

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Fig. 1A, B. Osgood-Schlatter disease. A Sagittal spin density image (SE 2000/20) shows infrapatellar thickening with involvement near the insertion at the tibial tuberosity. There is an intratendinous focus of increased signal that is probably a chronic tear (arrow). B T2WI (SE 2000/80) shows a further increase in signal intensity from the probable chronic tear (arrow)

Fig. 2. Jumper’s knee. Sagittal spin density image (SE 2000/20) shows preferential thickening of the proximal infrapatellar tendon with a chronic tear appearing as a region of increased signal intensity (arrow)

Results

The hallmark of chronic patellar tendon abnormalities is tendinous thickening. All seven of the abnormal tendons imaged in this study appeared as low intensity structures on T1WI and T2WI. In the four cases treated surgically the findings confirmed that the tendons were truly enlarged. The degree of thickening varied from subtle to grossly abnormal. Our experience is too scant to recognize subtle thickening accurately unless it is focal.

Tendons were either focally or diffusely abnormal. Focal thickening involved the distal patellar tendon in the patient with Osgood-Schlatter disease (Fig. 1). The abnormal tendons classified as “jumper’s knee” tended to have focal enlargement of the proximal infrapatellar tendon although the entire tendon was usually enlarged (Fig. 2). The single case of “jumper’s knee” that was not treated surgically has been followed clinically and did well initially with restricted activity; however, symptoms recurred after the patient resumed exercise.