Intramuscular ganglia arising from the superior tibiofibular joint: CT and MR evaluation

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Abstract. Objective. To evaluate the role of magnetic resonance imaging (MRI) and computed tomography (CT) in the diagnosis of intramuscular ganglia (IMG) that arise from the superior tibiofibular joint (STFJ).

Material and methods. Our series consisted of three men and three women. Four patients were studied by MRI, one by CT only, and two by both modalities. Contrast was used in one of the two patients studied by CT. MRI was obtained in at least two orthogonal planes to demonstrate the relation of the ganglia to STFJ.

Results. The MR and CT appearance of these ganglia was basically that of a well-defined soft tissue mass with low attenuation on CT images consistent with the presence of fluid. On MR studies, they had an isointense signal on T1-weighted images and a homogenous high-intensity signal on T2-weighted images. MRI demonstrated the attachment of these ganglia to the STFJ.

Conclusion. CT and MRI were effective, noninvasive modalities in the evaluation of IMG. The imaging features on both modalities were consistent with the presence of fluid-containing lesions that had close proximity and were attached to the STFJ. The combination of location and the fluid consistency of these lesions facilitated the diagnosis.

Key words: Soft tissue neoplasms, diagnosis, ganglion – Intramuscular – Magnetic resonance – Computed tomography

Cystic lesions around the knee are a common clinical problem and can be evaluated with a variety of radiographic techniques including arthrography and sonography [1]. Popliteal cysts are the most common lesions and are frequent finding in studies performed for internal derangement of the knee. Cystic lesions in other locations around the knee are less common and usually are meniscal cysts or ganglia [2]. Meniscal cysts are characteristically located at the joint line on the medial or lateral side of the knee and are usually associated with an underlying horizontal meniscal tear [2, 3]. Ganglion cysts may occur in atypical locations: attached to the tendon sheath, within muscle bundles, within the sheath of the common peroneal nerve, or attached to the superior tibiofibular joint (STFJ) [4-7]. The excellence of magnetic resonance imaging (MRI) in evaluating soft tissue masses makes this technique ideally suited to evaluation of these cystic lesions [8]. In this report, we review our experience with computed tomography (CT) and MRI of six IMG arising from the STFJ.

Material and methods

The six patients were referred to our orthopedic service with their imaging studies performed in other institutions. They were three men and three women who ranged in age from 23 to 60 years, with a mean age of 43 years. They all presented with a swelling in the proximal part of the leg, which was painful in only one patient (case 1). Physical examination revealed an ill-defined, firm muscular swelling deep to the deep fascia. All the objective neurological signs were absent. Plain radiology had been performed in all patients. Five had been studied by MRI and two by CT. Contrast was used in one of the two CT examinations. The MR images were obtained using different imagers operating at 0.5 to 1.5 tesla. Imaging sequences included spin-echo T1-weighted 500–740/12–21 ms (repetition time/echo time) proton density-weighted and T2-weighted 1800–4000/60–100 ms pulse sequence. Section thickness varied from 4 to 10 mm. No contrast enhancement was used with MRI. Plain radiography, CT, and MRI were performed in case 1. Plain radiography and CT were obtained in cases 2 to 5. Plain radiography and CT were done in case 6. Imaging features were examined in each case: for plain radiography, soft tissue mass, cortical erosion, scalloping, and periosteal reaction; for CT, margination, attenuation, and bone changes; and for MRI, margination, site, signal intensity, and relation to the STFJ.
Results

Plain radiography did not demonstrate significant soft tissue mass or bone changes.

CT revealed a sharply defined rounded soft tissue mass having the attenuation of fluid. The mass lesion did not enhance after contrast injection. Septation within the fluid-containing lesion was noted in case 1.

On MRI, the intramuscular lesions were isointense or hypointense compared to the surrounding muscles on T1-weighted images. All had high-intensity signal on T2-weighted images. Septation was noted on the T2-weighted images in case 1. Three ganglia were located in the tibialis anterior muscle (cases 1, 4, 6). The peroneus longus muscle was the site of two ganglia (cases 2, 3). One ganglion was in the soleus muscle (case 5). In four of the five cases studied by MRI, the attachment of the ganglia to the STFJ was demonstrated (cases 1–4). All six patients underwent surgical excision of the ganglia and the attachment of the ganglia to the STFJ was confirmed in all cases. Recurrence in a period varying from a few months to 3 years occurred in four patients (cases 1–4). This was confirmed by ultrasonography in case 2, MRI in case 4, and physical examination in cases 1 and 3.

Discussion

Reviewing the literature, there are several reports describing ganglia intraneurally involving the common peroneal nerve. They were called “intraneural ganglia” by the authors who described them. Among the reports are those by Waldstein [6] in 1931, Ellis [9] in 1936,