CLINICALLY SPEAKING

Atypical Localization of Enchondroma in the Calcaneus

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A 53-year-old man presented to the orthopedic outpatient clinic with pain and swelling in the right heel without any trauma. On physical examination and radiologic assessment, a lesion with calcification and peripheral sclerosis was detected in the medullary cavity of the calcaneus, and computed tomographic images revealed cortical thinning adjacent to the lesion. Magnetic resonance images showed a 23 × 19-mm lesion. Tru-Cut biopsy, performed to clarify the diagnosis, revealed an enchondroma. As a definitive treatment, curettage of the lesion and grafting of the cavity was performed. Although enchondromas are common pathologic abnormalities of the skeleton and are usually asymptomatic, atypical localization, such as the calcaneus, and atypical clinical manifestations, such as heel pain, should also be kept in mind. (J Am Podiatr Med Assoc 105(3): 260-263, 2015)

Enchondroma is a benign tumor of mature hyaline cartilage localized in the medullary cavity of bone. Although it can be seen in all decades of life, it usually presents in the second to fourth decades of life.1-3

Enchondroma is usually detected incidentally as a well-defined radiolucent lesion with varying degrees of stippled densities in the bone.4,5 Fibrous dysplasia, giant cell tumor, epidermoid inclusion cyst, solitary bone cyst, benign chondroblastoma, low-grade chondrosarcoma, and bone infarct should be considered in the differential diagnosis.6-8

Although case series and atypical localizations of enchondromas are reported in the literature, there is no report of enchondroma in the calcaneus. We report a case of enchondroma with an atypical localization: enchondroma of the calcaneus.

Case Report

A 53-year-old man presented to the orthopedic outpatient clinic with pain and swelling in the right heel. There was no history of trauma. Physical examination revealed moderate tenderness on the posterior of the calcaneus. On radiologic assessment, a lesion with calcification and peripheral sclerosis was detected in the medullary cavity of the calcaneus, and computed tomographic images revealed cortical thinning adjacent to the lesion (Figs. 1 and 2). Magnetic resonance images showed a 23 × 19-mm lesion with hyperintense signaling on T2-weighted sequences (Fig. 3) and a peripheral heterogeneous enhancement pattern on contrast-enhanced T1-weighted sequences (Fig. 4). Based on these findings, the patient was suspected to have an enchondroma, and Tru-Cut biopsy was performed to clarify the diagnosis. Histopathologic examination at low power revealed lobules of different sizes of hyaline cartilage tissue (Fig. 5) and chondrocytes without atypia inside hyaline cartilage. The nuclei were small, round, and pyknotic in a single lacuna (Fig. 6). These findings confirmed the diagnosis of enchondroma. Using a lateral calcaneal approach, curettage of the lesion and grafting of the cavity was performed (Fig. 7). The histopathologic examination of the curettage material again revealed enchondroma, similar to the first biopsy.
Discussion

Enchondromas are usually asymptomatic and are usually detected incidentally with direct radiography.\textsuperscript{9} When they become symptomatic, the most common cause of pain is an increase in the pressure due to cortical expansion of the lesion.\textsuperscript{1} In the present patient, the enchondroma was symptomatic owing to cortical expansion of the lesion and the high load on the calcaneus as a weightbearing bone.

To our knowledge, there is no report of calcaneal enchondroma in the literature. Enchondromas are usually seen in the phalanges of the hand and can also be found in the phalanges and metatarsal bones of the foot. Enchondromas of the rib, talus, and spine have been reported in the literature.\textsuperscript{9-12} Isolated enchondroma of the atlas has also been reported by Wani et al.\textsuperscript{13} Two cases of enchondroma as a rare cause of midfoot pain have been presented by De Yoe and Rockett.\textsuperscript{4} However, there is no reported enchondroma of the hindfoot.

Unicameral bone cyst is the most common lytic lesion in the calcaneus. It presents as a well-defined oval-shaped radiolucency. There is minimal or no bony septum in the cyst. Its radiologic appearance is so characteristic for diagnosis that biopsy is not necessary to confirm the diagnosis.\textsuperscript{14} Aneurysmal bone cyst, chondromyxoid fibroma, intraosseous ganglion, osteoid osteoma, benign chondroblastoma, and low-grade chondrosarcoma are the other tumoral pathologic abnormalities of

\begin{figure}[h]
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\includegraphics[width=0.5\textwidth]{figure1}
\caption{Radiographic image of the calcaneus showing the lesion with radiolucency and peripheral sclerosis.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure2}
\caption{Computed tomographic image showing the lesion localized in the calcaneus, with thinning of the cortex.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure3}
\caption{T2-weighted magnetic resonance image of the mass exhibiting hyperintense signal intensity.}
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\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure4}
\caption{Contrast-enhanced T1-weighted image of the mass exhibiting a peripheral heterogeneous enhancement pattern.}
\end{figure}
In suspicion, biopsy is necessary to differentiate benign tumors from other benign aggressive and malignant bone tumors. In this case, biopsy was initially performed to confirm the diagnosis, and then curettage and grafting, which is the standard method of treatment, was performed.17

Conclusions

Although enchondromas are common and usually asymptomatic pathologic abnormalities of the skeleton, atypical localization, such as the calcaneus, and atypical clinical manifestations, such as heel pain, should also be kept in mind, and biopsy should be the first choice to differentiate benign and malignant lesions and to confirm the diagnosis.

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References

11. LAORUENGTHANA A, GALASSI M, WEERAKUL S, ET AL: Result of