Localized pigmented villonodular synovitis in the knee of a young girl diagnosed by Ultrasound

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ABSTRACT
A young girl with a swollen knee was examined and proved to be a case of localized pigmented villonodular synovitis of the knee. Ultrasound showed a mass in the suprapatellar bursa. The synovium was seen thickened and there was a separate mass in a shape of a loom.

Keywords: Pigmented villonodular synovitis, knee ultrasound.

12 year old female complaining of left knee pain and swelling for a period of two months was presented. The symptoms started suddenly with knee pain and limitation of movement which was worsened with time. No previous history of any trauma was found. Her parents are first-degree consanguineous, a total of three brothers and two sisters are all healthy. No similar illness known in the family.

On examination, all the joints appeared normal except for the left knee which was swollen with a cystic area in the suprapatellar pouch. The hemogram and urine analysis showed normal results. Plain film of the knee was unremarkable but ultrasound showed effusion in the joint with synovial thickening of posterior aspects of the suprapatellar bursa. Originating from this thickening was an elongated soft tissue mass of 2cm in length and of slightly homogeneous echogenicity (Fig. 1). An arthroscopic synovial biopsy and partial synovectomy revealed synovial hypertrophy with some villi and a fair number of visible blood vessels.

Pigmented villonodular synovitis (PVNS) is a monoarticular process of unknown etiology. It belongs to a group of benign proliferative lesions of the synovium of either the joint, the bursa or the tendon sheath.

The condition was first described in 1941 by Caffe Cowvorkers. It is mainly a disease of adolescents and young adults, but the age range extends from the second to the seventh decades. Although the knees are most commonly affected, the incidence in the finger joints and tendon sheaths is also high.

Discussion. Ultrasound of joints has proved to be excellent imaging modality which allowed direct visualization of the synovial process which revealed synovial thickening, pedunculated nodules and fluid effusion.

A few cases of adolescents are on record. The possible youngest patient published was a four and half year old child. The knee is the most frequently affected joint, but any synovial joint can be involved.

Synovial lesions are either localized or diffused. The localized form usually involves the small bones of the hand and is labelled nodular synovitis; the diffused type being the most common within the large joints. The present case represents a rather nodular type in a major joint. The pathogenesis of the condition is still unresolved and suggested theories include inflammation, trauma, localized disturbance in the metabolism of lipids, and a benign neoplastic process.

In the past, diagnosis was only possible at a late stage of development of the condition, i.e. when erosive osseous changes were discernible on plain films. Prior to US the ability to image synovial processes was limited and only the immediate phase of a bone scan was able to show synovial reaction. Arthrography only outlines surface contours with indirect imaging of cartilage and synovium, while computerized tomography (CT) has too limited contrast resolution for visualization of the synovium. Angiography is an invasive procedure which might show a synovial blush, the same as the much less invasive three-phase bone scan will show. Until such time when magnetic resonance imaging

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Figure 1 - Ultrasound left knee, transverse suprapatellar area. Effusion in the suprapatellar bursa. The synovial lining is thickened. A loom-shaped structure of synovial echogenicity is seen originating from posterior aspects of the synovia.

becomes more widespread and less expensive, US should be the first choice of examination performed to evaluate enlarged joint.

Conclusion. In conclusion, the use of ultrasound prior to synovial fluid aspiration and surgery, appears to allow early diagnosis of this rare condition, characterized by lack of both specific clinical signs and conventional radiological findings.

References