

Rare form of intramedullary osteosclerosis in the tibia

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Abstract— The intramedullary osteosclerosis (IMOS) is a rare condition with no specific radiographic features - except the increased bone formation, which is not due to heredity, infection, acute trauma or system disorders such as skeletal dysplasia. IMOS is usually diagnosed randomly - after imaging study of the affected leg - which usually has pain that intensifies with physical activity. The laboratory findings are typically normal. Intramedullary osteosclerosis may affect a single or multiple bones without clear periosteal reaction, soft-tissue swelling, nor nidus. For being a rare condition and because of the lack of certain specific features the intramedullary osteosclerosis is still not well understood. This is why the diagnostic process is difficult and usually comes with delay.

Keywords— intramedullary osteosclerosis, tibia

1. Clinical case

A 14-years-old patient active athlete is admitted in the clinic with complains of mild, intermittent pain in the right thigh, aggravating with physical activity. The symptoms first appear 3 months ago, with no trauma or other conditions presented. Clinical examination revealed palpable discrete swelling of the soft tissues. After series of radiographs, CT and MRI of the left thigh - a not-well-defined, localized periosteal reaction is noted (and almost full obliteration of the intramedullary canal of the right tibia in its proximal third (Fig.1), (Fig.2), (Fig.3). On the CT scan - a stress fracture is noted in the phase of partial consolidation. Normal blood test results are presented. The differential diagnosis includes malignant process and for its exclusion an open biopsy was performed with trepanation and curetage of the bone. Fully obliterated intramedullary canal was found. Materials taken from the bone and the periosteum show no signs of malignancy and confirmed the presence of osteosclerosis. Postoperatively the pain diminished significantly. The patient was advised to quit sports activities for a period of several months. 90 days later the X-ray image of the right thigh showed no change (Fig.4), (Fig.5).



Fig.1

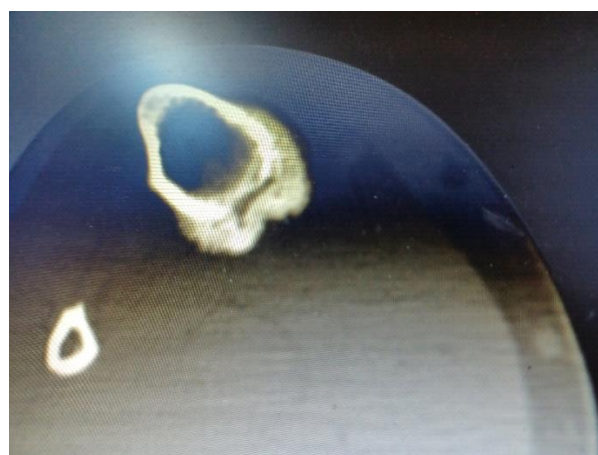


Fig.2

2. Discussion

The intramedullary osteosclerosis was first described in 1988 from Abdul-Karim FM as an unusual pathological condition characterized by endosteal new bone formation and sclerosis in the diaphysis of long bones in adults, more commonly seen in females. The tibia is the most affected bone, with the femur on the second place.

The imaging studies demonstrate homogenous sclerotic process primary located in the intramedullary canal. In most cases the cortex remains unchanged or slightly thickened assymetrical. IMOS have several differential considerations, such as hereditary skeletal dysplasia, malignancy, inflammation and acute trauma^{2,3,4,5}. However the imaging studies and clinical examination permit us to distinguish the IMOS from the conditions listed above. In the cases of IMOS the presence of periosteal reaction is rarely observed, which is typical for the osteosarcoma, lymphoma, blastic bone metastasis and others⁶. The osteoid osteoma is usually presented with a sclerotic margin and radiolucent nidus⁷.

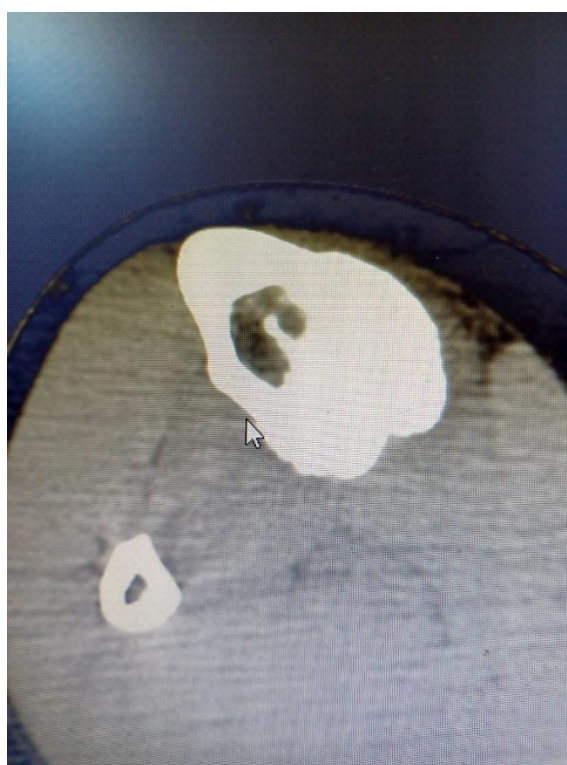


Fig.3

The chronic form of osteomyelitis leads to bone sclerosis, but there are specific clinical appearance and laboratory findings⁸. The healing stress fracture is part of the differential diagnosis because of the presence of bone sclerosis⁹. Some metabolic and endocrine diseases such as the renal osteodystrophy and pseudohypoparathyroidism can cause bone sclerosis, but are distinguished because of the laboratory tests results and the larger are of the sclerosis. Some genetic disorders such as Camurati-Engelmann

disease and Ribbing disease lead to IMOS but are manifested in young age and affect both the sexes equally^{10,11}.



Fig.4



Fig.5

Even with unknown etiology IMOS leads to swelling of the bone marrow that causes pain. Some authors recommend pain relief through opening a window in the bone, rimming or curettage^{7,16,17}. Kang et al. treated patient with IMOS by intramedullary rimming¹⁶. They suggest that the medullary decompression leads to pain relief without removing the cause of the IMOS¹⁶. Kensaky et al. consider that the open biopsy not only provides histological materials but allows medullary decompression³².

3. Conclusion

The available publications in the literature show information for single cases of IMOS and do not answer the questions about the etiopathogenesis of this condition and about the criteria for prevention and treatment. Future clinical trials and scientific researches for a longer period of time are expected to specify the methods of treatment.

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