



RESEARCH ARTICLE

HEALING OF BONE BRUISE IN DIFFERENT KNEE INJURIES AS PER MRI

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ABSTRACT

MRI has become the modality of choice in acute knee injuries. It assists the clinician in diagnosing ligamentous & meniscal injuries. Also subchondral osseous contusion known as bone bruise can be assessed. These occult osseous injuries produce persistent pain, loss of function. They are not detected by clinical examination or x rays. The present study aims to assess significance of bone bruise following trauma of knee & their presence in isolation or in association with soft tissue damage

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INTRODUCTION

Over the past two decades MRI has become the investigation of choice for acute knee injuries. The findings of clinical examination are confirmed by MRI. Also subchondral osseous lesion "Bone bruise" is visualised as an abnormal signal within adjacent subchondral bone. They are observed as signal loss in T1 weighed images & increased signal in T2weighed images. They cause pain & functional loss of knee. They resolve in 6-12 weeks to 12-24 weeks & may take about 24 months in some patients. This study aims at significance of bone bruise after knee trauma. Also its association with soft tissues injuries of knee & healing pattern will be observed. Classification Lynch et al classifies bone bruise in 2 types. In type 1 bone bruise is without cortical disruption & in type 2 bone bruise is in presence with cortical disruption. Another classification by Vellet et al divides the in 2 types reticular and geographic. In the former, bruise resembles strands of net and are placed away from subchondral bone whereas in the latter, they are discrete, located near the subchondral bone. Bone bruise occurs at site of impact and these types depend on surface area of bone over which injury is distributed.

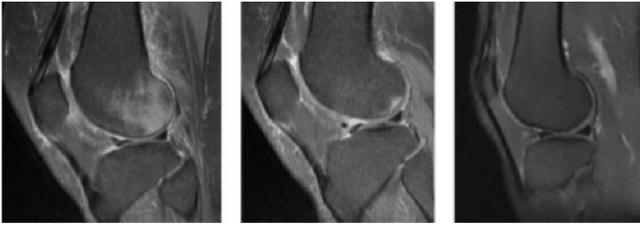
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MATERIALS AND METHODS

This prospective study was done in GMC Jammu from 20th august 2013 to 20th july 2015. Following knee trauma in patients and after clinical examination, We sent patients for MRI and according to the findings divided the patients into 3 groups

- Pt.s with isolated bone bruise on MRI
- Pt.s with bone bruise & ligamentous /collateral injury
- Pt.s with bone bruise & meniscal injuries.

These Pt.s were then followed every 3ths with MRI to see the healing status of bone bruise. Exclusion criteria- Pt.s with pre existing knee pathology, Rheumatoid arthritis, Osteoarthritis. MRI Technique Standard knee MRI with tT1 coronal and T2 sagittal sequences were done and the results noted. Diagnosis of bone bruise was done by classification given by Lynch et al by presence of decreased signal on T1 images and increased signal on T2 images. Also the associated soft tissue injuries were observed and noted. Results-In this study 30 patients with mean age 32 years (range 24 to 51 yrs) were reviewed. All were admitted as traumatic knee injury. Cause of knee pain was walking long distances in 6 pt.s, fall from height (<3 mtrs) in 14 patients and minor knee trauma in 10 patients. The patients had no history of prior surgery of knee or chronic knee pain.



MRI knee showing resolving of bone bruise on follow up MRI done at injury, 3mths, 9mths

Mean restriction of ROM was 20 degrees (10 to 40 degrees mean). Minimal joint effusion was seen in 16 patients. No abnormality was seen on AP and lateral x rays of the knee. MRI was done and patients were then grouped in 3 groups as per the soft tissue injury. In group 1 (10 patients) pt. s had isolated bone bruise on MRI. In group 2 (10 patients) bone bruise in association with ligamentous /collateral ligament injury and in group 3 (10 patients) bone bruise with meniscal injury. Pt.s in group 1 had complete recovery in 5 mths (3 to 6 mths). in group 2 recovery was in 12 mths (6 to 18 mths) & in group 3 it was 6 months (5 to 8 mths)

Discussion-No consensus is there at present on natural history of bone injuries secondary to minor knee trauma. In these low energy trauma rest to the part generally resolves the symptoms in a short period of time. Preventing loading of the joint is sufficient in them. Improvement usually occurs in 6 months. X rays are not beneficial in detecting these soft tissue injuries whereas are helpful in bony injuries. MRI has become the modality of choice in them. It is a non invasive technique that shows knee joint injuries accurately & is in use for past few decades. Radiographs in our patients showed no abnormality. MRI images showed bone bruises along with other soft tissue injuries in some as decreased intensity on T1 images and increased intensity on T2 images. Fracture line was not detected in bony parts. Bruises not seen in x rays were clearly defined on MRI. Mechanical stress on bone in subchondral region lead to contusion type injuries. Conclusion-Addition of MRI has helped the clinician in diagnosing meniscal /ligamentous injuries along with ability to see occult osseous lesions. Presence of bone bruise may represent significant articular cartilage damage and may alter natural course of soft tissue injuries of knee. Isolated bone bruise heals early & bone bruise along with ligamentous injuries like ACL take much longer time to recover than other injuries.

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