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AVASCULAR NECROSIS OF HIP FOLLOWING RENAL TRANSPLANTATION – MRI IS THE BEST MODALITY FOR DEFINING THE LESION

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ABBREVIATIONS

AVN : Avascular necrosis
MRI : Magnetic resonance imaging
MMF : Mycofenolate mofetil

KEY WORDS

avascular necrosis, renal transplantation

INTRODUCTION

The major focus of renal transplantation in the earlier era was to achieve and sustain a functioning graft as well as recipient survival. Over the period of time, transplantation has taken a special position for itself as the choice of therapy for end stage kidney failure. Graft and patient survival have remarkably improved over the last five decades with improvement in skills and therapeutic modalities. This has now redirected the focus of Transplantation Medicine towards improving upon the quality of life post-transplantation. Avascular necrosis (AVN) is one of these issues that need to be addressed. We report here a case of AVN post-transplant that was diagnosed earlier using magnetic resonance imaging (MRI).

CASE REPORT

A 28 years old female underwent renal transplantation with HLA mismatched donor on 24th November, 2003. She was on triple drug immunosuppression of steroid, Cyclosporin (CsA) and mycofenolate mofetil (MMF). She had one episode of steroid responsive acute vascular rejection at 15 days posttransplant. After 9 months of transplantation she presented with pain in right hip joint. Two weeks after this event, she came back to the outpatient clinic with limping right leg accompanied by restricted hip movements. She was referred to the radiology department for plain x-ray of hip joint (fig. 1)

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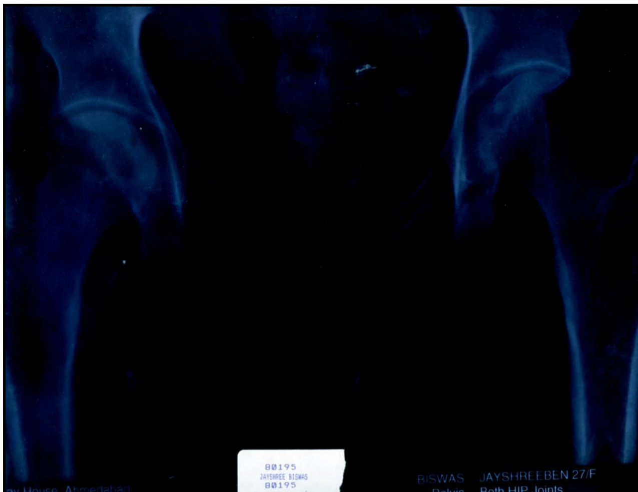

Figure 1 X-ray AP view of hip joint showing deformed shape, increased density and sub-articular translucencies in the head of the right femur.

X- ray (AP view) of hip joint showed deformity of shape of the head of right femur, along with increased density and few sub articular translucencies. Considering this, she was referred for MRI (Fig. 2).

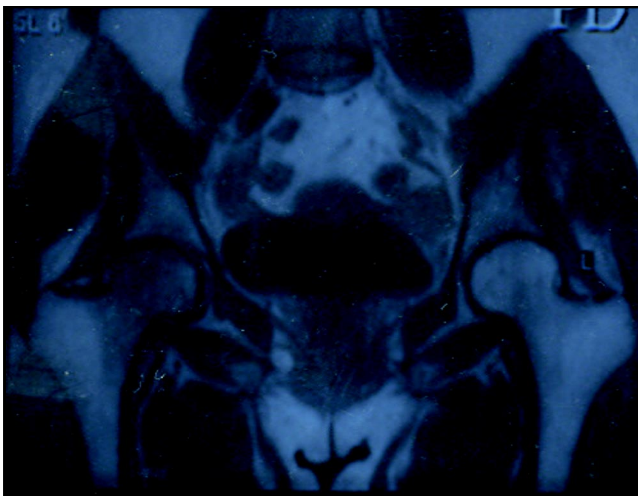

Figure 2 T1 weighted MRI picture showing hypo intensity in the head and neck of right femur.

X ray findings were confirmed on MRI which showed significant hypo intensity in the head and neck of the right femur. The hip joint was normal. The patient was treated conservatively for one month. A repeat MRI (Fig. 3) was performed.

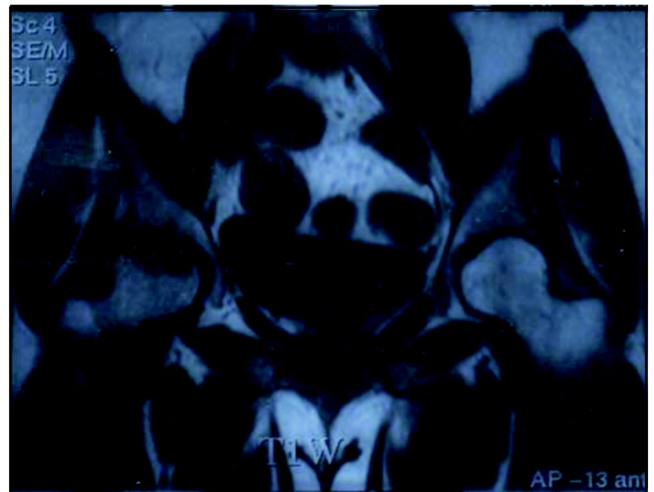

Figure 3 Repeat MRI 1 month later showed worsening of changes in right femur along with extension of hypo-intensity in to the joint cavity.

This time MRI showed significantly increased hypo intensity along with its extension in the hip joint which suggested worsening of the staging of AVN. She was treated with core decompression and supportive treatment for 4 months following which she was better symptomatically and had no gait abnormality. Repeat x-ray showed worsening of features with presence of “double line sign” and more significant deformity and sclerosis of the head of the femur (Fig. 4).

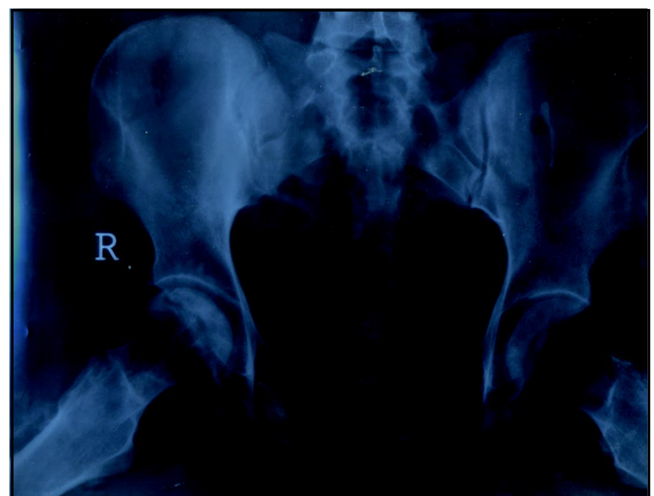

Figure 4 Repeat x-ray 4 months later showing significantly increased density along with “double line sign”.

She is regularly followed up in the out patient clinic. She is symptomatically better however radiologically she has deteriorated and has been advised for total hip replacement.

DISCUSSION

AVN is one of the major causes of morbidity after transplantation [1]. This skeletal complication has also been labeled as aseptic necrosis, osteonecrosis and osteochondritis dessicans. AVN is defined as the death of marrow cells, associated trabeculae and osteocytes, essentially without infection. The apparently synergistic role of steroids and hyper parathyroid bone diseases has been responsible for its etiopathogenesis in allograft recipients [2]. A meta-analysis of studies including transplanted recipients and patients with lupus erythematosus found an association between AVN and the cumulative dosage of oral steroids, but not with methyl prednisolone pulses [3]. It is suggested that although excessive steroid therapy is positively harmful, AVN is not its invariable complication**.** Our patient received a cumulative dose of 5.7 gm per year. Genetic predisposition is one of the etiologic factors responsible for AVN in renal transplant patients [4]. A review of the literature including early studies showed that AVN affects 3- 41% of renal allograft recipients [5]. However over the last few years the incidence of AVN has decreased, because of lower dose of steroids, better control of pre transplant hyperparathyroidism, and better clinical and nutritional condition of the patient at the time of transplantation [6].

About half of the cases present within 2 years of transplantation. AVN develops in weight bearing bones, femoral head being the most common site [7].

Plain x-rays were the most frequently used method of diagnosing AVN until recently, however their sensitivity of detecting early stages of the disease is as low as 41 %. A delay of 1-5 years can occur between the onset of symptoms and appearance of radiographic abnormalities. CT scan is able to help define the extent of disease better at stage II. It enables detection of subchondral or cancellous fractures and collapse, especially when using multiplaner reconstruction which is essential for planning treatment. Bone scintigraphy is very non specific for diagnosing AVN. Bone Scintigraphy and Single Photon Emission Computed Tomography are used as an alternative only when MRI is not available. At present MRI is the best technique to diagnose early AVN of femoral head. An early diagnosis may permit less invasive treatment in the early clinical course. MRI provides the standard criterion of non invasive diagnostic evaluation. It is more sensitive than CT scanning or scintigraphy and is much more sensitive than plain film radiography. Using a 1.5 T magnet, Beltran et al found 88 % sensitivity, 100 % specificity and 94 % accuracy for MRI [8]. MRI is indispensable for accurate staging of AVN because images clearly depict the size and extent of the lesion.

Treatment of AVN depends on the progression of infarct. In early stages of disease purely conservative management is short lived. Attempts to preserve femoral head by core decompression may be desirable. Decompression is useful in pain relief, but femoral head often deteriorates. In advanced stages total hip replacement in renal allograft recipients allows significantly increased activity and relief from pain [9].

Our case report of AVN diagnosed by plain x-ray and MRI 9months post transplant occurring due to high dose of steroids helped the patient in providing symptomatic relief and delaying total hip replacement due to timely intervention.

CONCLUSION

High degree of clinical and radiological suspicion should be emphasized in a renal allograft recipient treated with high dose of steroids. MRI is the best modality to diagnose AVN in early stages. It facilitates better response to treatment since AVN is diagnosed at an earlier stage and therapeutic measures are more successful at the earlier stage of initiation. MRI further helps by guiding interventional procedures like core decompression.

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