

# Osteonecrosis of bilateral femoral heads after short term steroid use

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## Abstract

**Introduction:** Osteonecrosis is a serious condition involving bone destruction that often results in significant morbidity. It is associated with various risk factors, among which administration of steroids has also been reported in literature.

**Case Presentation:** A 24 year old man was diagnosed with Craniopharyngioma. He underwent transorbital hypophysectomy and post-operatively received eight weeks of tapering dose of oral dexamethasone. Several months later he developed bilateral hip pain and was diagnosed with bilateral femoral heads osteonecrosis requiring surgical treatment.

**Conclusion.** Osteonecrosis is a recognised complication of steroid use. Multiple reports elucidating this relationship have been published but there is no consensus on the dose, route and duration of steroid therapy that increases the risk of this complication. Informing patients of this potential adverse effect is appropriate prior to commencing steroids as early recognition may prevent complete destruction of the bone and hence need for surgical intervention.

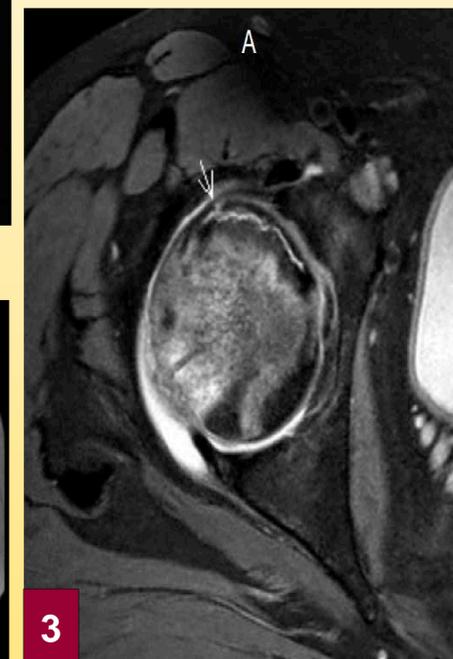
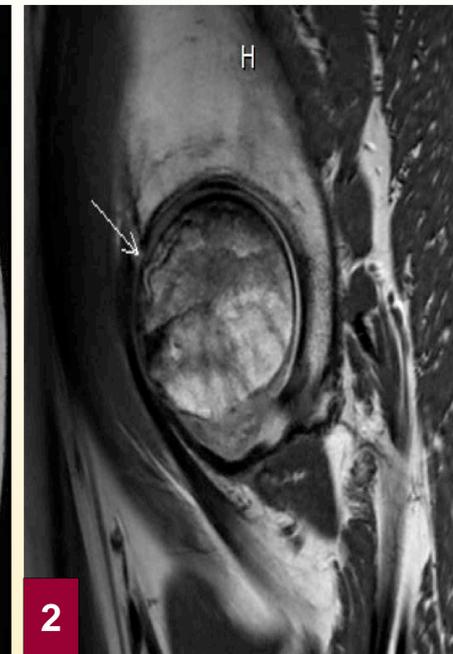
- Patient was started on 3mg PO Dexamethasone Q12 hourly post-operatively. Patient was then gradually weaned off the steroids in a tapering dose fashion over the course of 8 weeks. During this time patient also received conventional radiotherapy and pituitary hormone replacement therapy with levothyroxine and testosterone gel.
- On 9/13/2022 patient presented again to ED with recurrent headaches. An MRI brain showed residual tumor with large intra and supra-sellar cyst compressing the optic chiasm. Patient then underwent trans-sphenoidal resection of the craniopharyngioma cyst and residual tumor. Patient did not receive any steroid treatment post-operatively.
- On 3/6/2012 patient presented to ER again complaining of vague pains in the hips. An MRI revealed bilateral Osteonecrosis of the femoral heads. Patient was then referred to Rheumatology and was diagnosed with Steroid-induced Osteonecrosis of the femoral heads and was then referred to Orthopedics.

## Case presentation

- This 24 year old man with no significant medical history presented to ED on 5/23/2011 with vomiting, headaches and right sided peripheral vision loss. His clinical examination was unremarkable but on a CT scan of his head he had large cystic and partially calcified sellar and supra-sellar mass associated with significant hydrocephalus. Patient was transferred to UCSF neurosurgery department and he underwent right orbital osteotomy and had tumor resection.

## Discussion

This is an interesting case of Osteonecrosis that was caused by steroids but with minimal and only brief exposure. Risk factors for the development of osteonecrosis can be grouped as trauma, medication induced, rheumatic and hematological diseases, malignancies, organ transplant related, infectious causes and miscellaneous disorders including Alcohol, pregnancy and smoking. Our patient is a 24 year old man who had no history to suggest an etiology other than steroid exposure.



**Figures: MRI of the Hip showing bilateral Osteonecrosis:**  
Clockwise 1. T1 weighted Axial view showing edema and necrosis. 2. Right Hip Sagittal view T1 weighted Image. White arrow showing articular surface collapse. 3. Left Hip Sagittal view on T2 weighted image showing the classical Crescent sign (White arrow) and 4. T1 weighted image showing the edema and necrosis.

Harvey Cushing first recognised the adverse effects of hypercortisolism on bone tissue in early 1930s and since then numerous cases have been reported in the medical literature that have made us aware of the development of Osteonecrosis in patients on corticosteroids<sup>1</sup>. The most commonly affected sites are femoral and humeral heads but it can occur elsewhere as well<sup>2</sup>. To date medical community has failed to develop a consensus on whether the risk of osteonecrosis is more related cumulative dose, maximum dose, route or duration of therapy<sup>3</sup>. Currently there are no guidelines that define a safe threshold dose of steroids. The onset of the symptoms is usually insidious and depends upon the joint involved. In the case of femoral osteonecrosis the unilateral hip pain is the presenting feature but this pain can be referred to the groin, thigh, knees or buttocks. The contralateral hip is ultimately involved in 55% of the cases. If the diagnosis is Stage 3-4 osteonecrosis then the treatment is complete joint replacement.

## Conclusion<sup>4</sup>

1. Health care providers should be aware of potential risks for osteonecrosis in patients treated with corticosteroids and patients should also be informed of this condition.
2. Patients who receive steroids via other routes such as intra-articular, inhaled or intra-nasal have a low but not Zero risk of developing osteonecrosis.
3. There is no "safe" threshold for the use of steroids.

## References

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