Skull Base Osteoradionecrosis following Radiotherapy for Acromegaly

Michael S. Harris, MD; Louis T. Moore, MD; Michael B. Pritz, MD; Don-John Summerlin, MD; Michael G. Moore, MD

Department of Otolaryngology-Head & Neck Surgery; Department of Radiation; Department of Neurosurgery; Department of Pathology & Laboratory Medicine
Indiana University School of Medicine, Indianapolis, Indiana, U.S.A.

ABSTRACT

Radiotherapy is often employed in the treatment of acromegaly. Osteoradionecrosis is among the most serious complications of radiotherapy. Proper diagnosis of ORN is important for early initiation of treatment in the form of surgical debridement and sequestrectomy, and/or hyperbaric oxygen (HBO) therapy.

INTRODUCTION

Radiotherapy is an important component in the management of nasopharyngeal carcinoma (NPC). It is also employed in the treatment of symptomatic pituitary adenomas recalcitrant to surgery or medical therapy alone. Skull base osteoradionecrosis (ORN) is a rare, but serious complication of radiotherapy. To our knowledge, this is the first report of a case of ORN following radiotherapy for acromegaly.

CASE REPORT

Presentation

A 49-year-old male with a past medical history of acromegaly secondary to a pituitary adenoma, who completed surgical debulking and external beam radiotherapy (5400 cGy) 4 years prior, presented for concern of tumor recurrence. Transsphenoidal clival biopsy showed no evidence of tumor recurrence or osteomyelitis; the absence of these findings and presence of fibrosis and chronic inflammation was consistent with osteoradionecrosis of the clivus.

Conclusion: Osteoradionecrosis is a rare, but serious complication of radiotherapy, which may present several years following completion of treatment. It should be included in the differential diagnosis of an expansive lesion in the context of post-radiation therapy. To our knowledge, this is the first report of osteoradionecrosis following radiotherapy for acromegaly.

DISCUSSION / CONCLUSION

Symptomatic pituitary adenomas that are not controlled by surgery or medical therapy alone are often addressed with conventional radiotherapy. The standard dose is 4500 to 5000 cGy delivered over four weeks in doses not exceeding 180 cGy per day, considerably less than that administered for NPC.

Osteoradionecrosis results from a pathophysiologic process characterized by radiation-induced cellular injury, fibrosis and formation of a hypovascular-hypoxic state, leading to tissue loss and chronic non-healing wounds. Hypoxic conditions and bone destruction may serve as a nidus for subsequent osteomyelitis, which our patient did not have.

The most common site of involvement of ORN of the head and neck is the mandible. Skull base ORN is a rarer finding, most commonly involving the whole skull base with the sphenoid sinus, followed in frequency by the clivus and internal carotid canal. Reported latency periods for skull base ORN associated with single course radiotherapy is 3-15 years.

The use of intracavitary brachytherapy, a boost technique used frequently in NPC -- as opposed to external beam radiotherapy employed here -- is a major risk factor for the development of ORN.

Definitive diagnosis is established by pathological examination with the exclusion of tumor recurrence and concurrent infection. Treatment consists of debridement and sequestrectomy when easily accessible, and/or conservative treatment or hyperbaric oxygen (HBO) therapy to increase tissue oxygenation and enhance the healing process.

Remaining cognizant of ORN of the skull base will lead to earlier identification of this entity and prevention of complications associated with delayed diagnosis.

REFERENCES