International Journal of Advanced Educational Research
ISSN: 2455-6157
Impact Factor: RJIF 5.12
www.educationjournal.org
Volume 3; Issue 2; March 2018; Page No. 165-166

Osteoradionecrosis of jaws

Dr. Kanupriya Gupta
MDS, Oral and Maxillofacial Pathology, PhD Scholar & Senior Research Fellow, Faculty of Dental Sciences, IMS, BHU, Varanasi, Uttar Pradesh, India

Abstract
Osteoradionecrosis is one of the most serious oral complications of head and neck cancer treatment. The predisposing factor is mostly trauma (extraction) and sometimes spontaneous a new early management protocol is proposed based on the current clinical criteria relating to osteonecrosis secondary to treatment with bisphosphonates, together with the adoption of new therapies supported by increased levels of evidence.

Keywords: osteoradionecrosis, bisphosphonates, head and neck cancer

Introduction

Osteoradionecrosis (ORN) is the most serious and important complication of radiotherapy. It was defined by Marx in 1983 as the presence of exposed bone in an irradiated field that fails to heal within a 3-month period [1]. ORN is a bone ischaemic necrosis caused by "3H" hypovascular, hypocellular, and hypoxic tissue and tissue breakdown (i.e. cellular death and collagenolysis that exceed cellular replication and collagen synthesis) followed by a nonhealing wound (e.g. tooth extraction), in which oxygen and metabolic demand exceed supply thus inhibiting substitution of cells to complete the turnover for the maintenance of homeostasis and wound cicatrisation [1-3].

More recently, another theory has been proposed stating that suppression of osteoclast-related bone turnover is the initial damage of the destructive ORN process. The underlying concept explains that osteoclasts sustain radiation damage prior to the development of vascular changes. It seems that "bisphosphonate-induced osteonecrosis" of the mandible supports this concept, as bisphosphonates also inhibit osteoclast-mediated bone resorption and can result in osteonecrosis [4].

Various predisposing factors associated are trauma (from surgical procedures), active periodontal disease or denture trauma, idiopathic or spontaneous necrosis, high-dose radiation >65Gray, field of radiation (volume of the mandible included in the field and proximity of maximal dosing to bone), use of implant sources too close to the bone, and combined interstitial and external beam irradiation [2, 3].

Classification of osteoradionecrosis

The Notani classification, is quickly applicable to all cases of mandibular osteoradionecrosis (ORN) after clinical examination and orthopantogram [5].

Notani Clinical features

Class

1. ORN confined to dentoalveolar bone
2. ORN limited to dentoalveolar bone or mandible above the inferior dental canal or both
3. ORN involving the mandible below the inferior dental canal, or pathological fracture, or skin fistula

The classification by Epstein *et al*., requires knowledge of the clinical course, distinguishing those actively ''progressing'' from more chronic ''persistent'' cases [6].

Type I	Resolved, healed
	(A) No pathologic fracture
	(B) Pathological fracture
Type II	Chronic persistent (nonprogressive)
	(A) No pathologic fracture
	(B) Pathological fracture
Type III	Active progressive
	(A) No pathologic fracture
	(B) Pathological fracture

A more recent classification given by Lyons *et al*., is based on the extent of the condition and its management [7].

Stage Description

1. <2.5 cm length of bone affected (damaged or exposed); asymptomatic. Medical treatment only.
2. >2.5 cm length of bone; asymptomatic, including pathological fracture or involvement of inferior dental nerve or both. Medical treatment only unless there is dental sepsis or obviously loose, necrotic bone
3. >2.5 cm length of bone; symptomatic, but with no other features despite medical treatment. Consider debridement of loose or necrotic bone, and local pedicled flap.
4. 2.5 cm length of bone; pathological fracture, involvement of inferior dental nerve, or orocutaneous fistula, or a combination. Reconstruction with free flap if patient's overall condition allows

Preventive measure ORN are taken 1 week before extraction, Pentoxyfylline (800 mg/d) and Alpha-Tocopherol (vitamin E)

1000 gm/d (Evion) for 2 months if ORN develop continue for 6 months and add Clodronate (bisphosphonates) after 3 months 1600mg/day 5 days a week for 6 to 12 months and if sequestrum is present give all the three drugs for 3 months before the planned sequestrectomy. Pentoxifylline (PEN, increase oxygenation) and alpha-Tocopherol (TO, antioxidant) synergistically reduces radiation induced fibrosis and is potentiation by combination with Clodronate (CLO, reduces bone destruction) also called PENTOCLO protocol for 3 to 12 months appears to be effective in ORN. First phase of protocol for treatment includes anti-inflammatory (20 mg of prednisone), antifungal (50 mg of fluconazole), antibiotic (2 g of amoxicillin-clavulanic acid/1 g of ciprofloxacin) and 20 mg omeprazole daily for 4 to 6 weeks to control local super infection in the irradiated zone followed by second phase of PENTOCLO protocol. Hyper baric oxygen therapy can also be used [8, 9].

Conclusion

ORN can lead to intolerable pain, fracture, sequestration of devitalized bone and fistulas, which makes oral feeding impossible. ORN is an expensive disease to manage no matter what course of treatment is used. The main goal of management is to prevent ORN by measures prior to the radiation but in diseased, prognosis of ORN depends on the stage of the diagnosis with early stage having better treatment outcome with medical management and later stages requiring surgical therapy and reconstruction with grafts.

References

1. Marx RE. Osteoradionecrosis: a new concept of its pathophysiology. J Oral Maxillofac Surg, 1983; 41:283-288.
2. Cronje FJ. A review of Marx protocols: Prevention and management of Osteoradionecrosis by combining surgery and hyperbaric oxygen therapy. SADJ. 1998; 53(10):469-471.
3. Marx RE. A new concept in the treatment of osteoradionecrosis. J Oral Maxillofac Surg. 1983; 41(6):351-357.
4. Jacobson AS, Buchbinder D, Hu K, Urken ML. Paradigm shifts in the management of osteoradionecrosis of the mandible. Oral Oncol. 2010; 46:795-801.
5. Shaw RJ, Dhanda J. Hyperbaric oxygen in the management of late radiation injury to the head and neck. Part I: treatment. Br J Oral Maxillofac Surg. 2010; 49(1):2-8.
6. Epstein. *et al*. Postradiation osteonecrosis of the mandible, a long-term follow-up study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod, 1997; 83:657-662.
7. Lyons A, *et al*. Osteoradionecrosis-a review of current concepts in defining the extent of the disease and a new classification proposal. Br J Oral Maxillofac Surg, 2014; 52:392-395.
8. Delanian S, Depondt, Lefaix JL. Major healing of refractory mandible osteoradionecrosis after treatment combining Pentoxyfylline and tocopherol: a phase II trial. Head Neck. 2005; 27(2):114-123.
9. Robard L, Louis MY, Blanchard D, Babin E, Delanian S. Medical treatment of osteoradionecrosis of the mandible by PENTOCLO: Preliminary results: A preliminary results. Eur Annal Otorhinolaryngol Head Neck Dis. 2014; 131(6):333-338.