Role of honey in osteoradio necrosis -
A case Report

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ABSTRACT

Osteoradionecrosis (ORN) is a devastating complication of radiotherapy in head and neck cancer. According to the most recent literature, ORN of the jaws is defined as exposed irradiated bone that fails to heal over a period of 3 months without any evidence of persisting or recurrent tumor. Although the pathogenesis mechanism is still under investigation, the most frequently reported reason is radiation arteritis, which leads to the development of a hypocellular, hypovascular, and hypoxic environment. The treatment methods are divided into two main categories: conservative treatment (improvement of oral hygiene and administration of antibiotics, analgesics and hyperbaric oxygen therapy) and surgical treatment.

Key Words: Osteoradionecrosis, Honey

Introduction

Osteoradionecrosis (ORN) is a radiation induced pathological process characterized by chronic and painful infection and necrosis accompanied by late sequestration and sometimes, permanent deformity. Radiation causes a proliferation of intima of blood vessels (endarteritis obliterans) leading to thrombosis of end arteries resulting in nonvital bone. Altered bone becomes hypoxic, hypovascular and hypocellular. Mandible is involved more than maxilla which could be attributed to restricted localized blood supply, higher bone density, inclusion of mandible in radiation field, higher amount of radiation being absorbed as well as higher amount of anastomoses in maxilla.

Case Report

A 61 years old male reported to Oral and Maxillofacial Surgery OPD, King George’s Medical University, Lucknow with chief complaint of pain and recurrent pus discharge in left mandibular anterior region. History revealed patient to be a biopsy proven case of squamous cell carcinoma of right alveolobuccal complex of mandible operated six years back who underwent radiotherapy three months later. Two years later extraction of left mandibular lateral incisor and canine was done. Subsequently, patient started experiencing pain and recurrent pus discharge from the region. Clinical examination revealed exposed necrotic bone with non healing socket. Diagnosis of ORN was established. Several treatment modalities–antibiotics, analgesics, ZnO Dressing were tried but without any relief. Pain, recurrent discharge and exposed bone were still present. We started, honey dressing twice a day which showed marked improvement and patient reported every month for check up. After 6 months of dressing all the symptoms resolved and bone was fully covered with normal healthy mucosa. Patient was asymptomatic and able to lead normal life without any recurrence.

Discussion

ORN is one of the most serious complications of radiation to head and neck, still exceptionally hard to treat. Bone exposure, fractures,
inflammation and wound healing disorders are the most commonly reported symptoms. Tooth extraction may play a crucial role in the pathogenesis of ORN (Hansen et al., 2006)\(^2\) and it is referred to as the most common reason for trauma induced ORN of the jaws accounting for 60–89% of cases (Murray et al., 1980)\(^3\). This could be explained by the mechanisms involved in the healing of a wound after extractions. In particular, a wound requires synthesis of proteins derived from cellular activity and vascular events (Maxymiw et al., 1991)\(^4\). However, ionizing radiation promotes irreversible cellular and vascular damage resulting in hypoxic, hypocellular and hypovascular tissue and affects the reparation process (Marx 1983 and Koga et al., 1984)\(^5\)\(^6\). Concerning local pathological conditions, marginal periodontitis (Niewald et al., 1996; Katsura et al., 2002)\(^7\)\(^8\) and denture irritation (Thorn et al., 2000)\(^9\) have been implicated in the development of ORN. The reason is that an open wound is present in the oral cavity during and after radiotherapy in these cases (Regezi et al., 1976; Murray et al., 1980 & Beumer et al., 1984)\(^10\)\(^11\)\(^12\). Diabetes mellitus, active smoking, excessive alcohol consumption and performance of a dental procedure as well as the presence of a local pathological condition are associated with an increased risk. Regarding the treatment of ORN, several methods have been suggested depending on the presence of a necrotic lesion, the response to conservative nonsurgical treatment, the patient’s general health, the prognosis for successful treatment of cancer, the patient’s wishes, the irradiation dose and the time interval between radiotherapy and ORN development. The treatment methods are divided into two main categories: conservative treatment (improvement of oral hygiene and administration of antibiotics, analgesics and Hyperbaric oxygen therapy) and surgical treatment.\(^13\) There is controversy in the literature regarding the initial treatment of choice. Some surgeons have concluded that conservative treatment should always be tried first, because in cases of failure a more radical approach can be performed; others claim that a radical approach should be instituted at the initial diagnosis.

Honey is one of the oldest traditional medicines considered to be important in the treatment of several human ailments. Treatment of infection has been practiced since the origin of mankind. In most of the ancient cultures honey has been used for both nutritional and medical purposes. Honey was used to treat infected wounds as early as 2000 years before. Bacteria were discovered to be the cause of infection. In 50 AD Dioscorides described honey as being good for all rotten and hollow ulcers. Honey has both anti inflammatory and antibiotic properties, antioxidant and greater influence on healing wound. Honey has been proven to create favorable condition in wound bed, autolytic debridement and presence of substances that promote and accelerate the healing process.\(^14\)

Honey exerts its effect via following mechanisms\(^15\)–

- Peroxide action causing angiogenesis and fibroblast proliferation
- Osmotic action removing slough and necrotic tissue
- Acidic action causing fibroblast proliferation and antibacterial action
- Antioxidant action
- Lymphocytic and phagocytic action

Conclusion

Honey seems to have potential to clear infection as well as being effective prophylactic agent that may contribute to reduce the risk of cross infection. Honey has both anti inflammatory, antibiotic and antioxidant properties and have greater influence on healing wound. Natural honey with its rich therapeutic action can be a simple and economic treatment modality for the treatment of osteoradionecrosis. Time will demonstrate whether the present optimism about honey is justified.\(^16\)

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REFERENCES