BISPHOSPHONATE THERAPY RELATED OSTEONECROSIS OF JAW BONES — A CASE REPORT

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ABSTRACT

Bisphosphonate related osteonecrosis of jaw bones is a relatively recent discovery with the first cases being identified in 2003. Bisphosphonates are used to treat multiple conditions especially metastatic bone diseases. Although the exact mechanism of action of Bisphosphonates is not well understood yet, efficacy of these agents in reducing bone pain, hypercalcaemia and skeletal complications has been widely accepted.

The recently introduced intravenous use of new generation bisphosphonates (Pamidronate and Zolidronate) has proved to be highly effective in controlling bone symptoms. The past few years have shown that osteonecrosis of jaw bones can sometimes develop in relation to long term bisphosphonate treatment, either spontaneously or by trauma caused by dental procedures.

The condition presents as a diagnostic challenge being rare and not well understood. We present a case report of a 56 years old female demonstrating a possible relation between osteonecrosis of jaws and long term bisphosphonate therapy in order to create awareness of this possible complication within the medical and dental community.

Key words: bisphosphonate therapy, osteonecrosis, jaw bones

INTRODUCTION

Bisphosphonate are non-metabolized analogues of pyrophosphates1 used for the treatment of bone malignancy such as multiple myeloma, skeletal metastasis associated with lung, breast and prostrate cancer, osteoporosis, osteopetrosis, Paget’s disease and osteogenesis imperfecta.2

Bisphosphonates influence the action of osteoclasts, interfere with calcium metabolism and reduce bone turnover up to 70%.3,4

Recent reports have indicated bisphosphonates to be associated with causing necrosis of jaw bones. The pathogenesis is not completely understood, but it is suspected that bisphosphonates cause osteonecrosis by inducing localized vascular insufficiency5.

CASE REPORT

A 56-year-old female reported to the Oral and Maxillofacial Surgery Department with mild discomfort in the upper left molar area. There was history of extraction under local anaesthesia of the upper left first molar about 2 years before the presentation. She had been diagnosed with multiple myeloma 6 years ago that was under treatment with bisphosphonates having received a total of 67 infusions of Zolidronic acid (Zometa) and Pamidronate.

Clinical examination revealed exposed necrotic bone; dark brown in colour. There was loss of trabecular pattern of bone distal to the second premolar area and radiolucency above it (Fig 2).

The adjacent second premolar presented with Grade II mobility and radiographic evidence of thickened

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Based on the history of bisphosphonate intake, clinical and radiographic examination, a diagnosis of bisphosphonate related osteonecrosis of jaw bones was made.

Bisphosphonate therapy was temporarily discontinued after consulting with the patient’s Hematologist. Local anaesthesia was administered and a three-cornered flap was raised to expose the necrotic bone completely (Fig 3).

The necrosed bone measuring 10 x 12 x 6 mm was then removed carefully keeping a layer of bone at the base to avoid exposure of maxillary sinus (Fig 4). Second premolar was extracted at the same time.

The wound was closed to allow for primary healing and the patient was asked to return for regular follow up visits.
The tooth and bone that were removed were sent for histopathological examination that revealed evidence of non-vital bone and external root resorption associated with granulation tissue containing a florid lymphoplasmocytic infiltrate lined by non-keratinized stratified squamous epithelium in places. Numerous microorganisms were also identified within the non-vital bone.

**DISCUSSION**

Osteonecrosis of the jaws associated with bisphosphonates was first identified in the year 2003. Since the initial discovery, numerous cases have been reported, majority of which are post extraction. The incidence of osteonecrosis in patients taking bisphosphonates is highly variable, ranging between 0.8-12%, the highest of which is related to intravenous infusion of Zolidronic acid (Zometa) and Pamidronate.

Awareness amongst dentists concerning this issue is limited. According to a survey carried out by the Department of Oral and Maxillofacial Surgery Department-Islamic International Dental Hospital, about 75% of dental practitioners admitted to be completely unaware of the possible complications associated with bisphosphonate therapy.

**RECOMMENDATIONS**

With patients receiving intravenous infusions of bisphosphonates, dental extractions pose a considerable risk of osteonecrosis of jaw bones. A thorough oral examination should be carried out before prescribing the drug. If any dental work is required, it should preferably be done before the treatment regimen begins. Oral health should be restored to best possible standards and patient motivated to maintain this.

If the patient is already taking the drug, less invasive practices, wherever possible should be undertaken. In case a dental extraction becomes unavoidable, the following protocol should be borne in mind:

- Routine follow-up to ensure adequate healing of the wound.
- Avoidance of open extraction procedures wherever possible.
- Antibiotic prophylaxis should be prescribed.

**CONCLUSION**

It has become imperative to raise awareness among dental and medical professionals about this serious complication of bisphosphonate therapy. Dentists entrusted to perform surgical procedures on patients undergoing drug therapy should be well informed and careful with their treatment proceedings and work in collaboration with the patients' physician to prevent such grave consequences.

**REFERENCES**

3. Hughes DE, MacDonald BR, Russell G, Gowen M. Inhibition of Osteoclast like cell formation in long-term cultures of Human Bone Marrow J. Clin. Invest 1989; 1930-35