Case report

DELAYED AND NON-HEALING WOUNDS IN ORAL & MAXILLOFACIAL SURGERY PRACTICE- A CASE SERIES

ABSTRACT

Wound healing is a physiological response to an injury. It is a very complex biological process. Oral cavity is a remarkable environment where healing often occurs without scar formation, even though oral cavity harbours millions of microbes. But instances of delayed or non-healing of wounds are not uncommon in the practice of oral and maxillofacial surgery. A plethora of causes have been suggested by various authors to account for these phenomena. Some of the common ones reported in the literature are the following[1]: old age, obesity, chronic diseases, vascular insufficiency, malnutrition, protein and vitamin deficiency, malignancy, anaemia, stress, immune-deficiency, infection and deficient oxygen delivery to tissues. Underlying systemic conditions are often ignored or undetected by general practitioners and this influences wound healing significantly. This article presents a series of unusual cases of delayed/ non healing wounds, which warrants the need of proper referral of such cases by general practitioners to tertiary care centres.

Key words: delayed, wound, non-healing

Case no.1 -Non healing extraction wound

Summary

Usually healing of extraction wound is an uneventful process. Both local and systemic factors may lead to delayed healing[1]. Usually local factors predominate in such situations. Decreased immune response is the most common systemic condition that is usually seen as the general cause. Systemic malignancies are often ignored as a contributing factor of delayed healing since the chances are often rare[2].

The following is a case report of a non-healing extraction socket, with an uncommon etiologic factor.

Patient information

58 year old female patient with complaint of non-healing extraction wound of two weeks duration with sprouting soft growth from the extraction socket reported to our out-patient department. She gave history of no other systemic disease other than that of hyper-lipidemia for which she was receiving treatment.

History of Presenting illness and clinical examination

She gave a history of painful 46 due to caries, for which she had undergone extraction two weeks back (Fig 1a). The extraction procedure was normal with minor bleeding which was arrested after suturing and pressure pack. On the 7th day sutures were removed and she was totally asymptomatic till that date. 3 days later a soft tissue growth developed over extraction socket with occasional bleeding. Initially it was suspected to be a granulation tissue by her dentist and she was advised to continue antibiotics and anti-inflammatory drugs. Subsequently, during the next 4 days, the growth rapidly enlarged to a massive sprouting one (Fig. 1b) to the extent that the patient experienced difficulty in closing mouth, with bleeding and mild paraesthesia

Fig: 1(a, b, c)

Fig 1a: Pre-extraction IOPAR, 1b: Sprouting growth, 1c: Post extraction OPG after 2 weeks

Diagnostic Assessment

An OPG was taken (Fig.1c) which was apparently normal.

To rule out the possibility of a systemic cause, random and fasting blood sugar as well as HbA1c estimation was done; which were normal. Haematology tests were also performed. The report showed that most of the parameters were within normal limits except for the following abnormal values (Table 1)

PARAMETER	PATIENT VALUE	NORMAL RANGE
WBC	37,100 cells/cumm	4,500-11,000 cells/cumm
Lymphocytes	53%	20-40%
ESR	110mm/hr	Male <10 Female<20
Platelets	50,000cells/cumm	1.5-4.5 lakh cells/cumm
PCV	29%	36- 48% in females

Table 1- Showing abnormal haematological parameters

Therapeutic Intervention

Possibility of a haematological malignancy was suspected and the patient was referred to Regional cancer centre. Following bone marrow biopsy and blood smear report

the diagnosis of B lymphoblastic leukaemia was made. This was later confirmed with other tests.

Follow up and outcomes

The patient was treated with chemotherapy, but unfortunately succumbed to the death after one month of diagnosis.

Case Report: 2-Post-operative surgical site infection after open reduction and internal fixation of fracture (ORIF)

Summary

Open reduction and internal fixation of maxillofacial fractures utilizing mini plates have shown the highest success rate. However, failures are not rare. Main reasons for soft tissue infection are improper techniques and underlying medical conditions of the patient which are sometimes overlooked. The following case report highlights the importance of adequate haemoglobin level and appropriate antimicrobial coverage required for uneventful healing after ORIF of facial bone fractures.

Patient information

57 year old male patient with previous history of ORIF in maxilla, right zygoma and right orbital floor reconstruction performed in our unit reported to our outpatient with surgical site infection, 14 days after surgery. Patient was having type ii diabetic mellitus, but was not under regular medications.

History of Presenting illness and clinical examination

Patient with history of fracture maxilla and right ZMC and floor or right orbit reported back with surgical site infection, 14 days after surgery. Patient was having type ii diabetic mellitus, but was not under regular medications. There was wound dehiscence in the right infra orbital region (Fig. 2a and 2b) with active pus discharge extra orally and from the right upper buccal vestibule

Diagnostic Assessment

Routine blood examination and culture sensitivity test were carried out. Since the patient was diabetic it was assumed that inadequate glycemic control after discharge from hospital was the cause of post-operative infection and wound dehiscence. But surprisingly the patient's glycemic control was adequate. The mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and Hb levels were considerably low. The culture and sensitivity report was also interesting. The microbial flora was resistant to the majority of the routinely used antibiotics except imipenam, ertapenam and tigecycline.

Therapeutic Intervention

The first priority was to raise the hemoglobin to a physiological level. 3 pints of Packed Red Blood Corpuscles transfusion was done after cross-matching. After the third transfusion hemoglobin level was raised to 11.6gm%. Also Tab Orofer XT once daily was given to control iron deficiency anemia. Antibiotic was changed to imipenam. Along with this dietary alternations were also done to control the nutritional deficiency. Surgical wound exploration, drainage of pus and debridement was done under local anesthesia. No foreign body like gauze piece could be located inside the wound as the cause for wound infection.

Within one week pus discharge subsided and healthy granulation tissue developed in the surgical site. Culture report was also negative by this period.

Follow up and outcomes

Patient was in a regular follow up for the six months and the wound was perfectly healed in the last visit (Fig 2c).

Fig: 2(a, b, c)

Fig 2a and 2b: Wound breakdown after 2 weeks, 2c: Surgical site after therapeutic management

Case Report: 3-Foreign Bodies in soft Tissue

Summary

One of the reason of morbidity in soft tissue injuries concealed foreign body entrapment. When delayed, the localization and removal of foreign bodies in soft tissue is challenging due to the associated inflammation/infection, granulated tissue, and fibrosis[16]. The following case report reveals the importance of thorough examination of facial wounds in the emergency department for foreign bodies such as glass particles.

Patient information

A 32 year old male patient (3a) reported to our department complaining of pain and swelling in the left lower border of mandible. Patient did not have any underlying comorbidities.

History of Presenting illness and clinical examination

Patient gave a history of road traffic accident (RTA) two weeks back. The primary care and suturing of lacerated wound in the left lower border of mandible was done at a local hospital. On clinical examination, there was no evidence of fracture mandible or dental focus of infection to account from the swelling and pain**.**

Diagnostic Assessment

Routine blood and urine examinations were done and all the values were within normal range. OPG was also found to be normal. Hence a USG of the area was performed. USG detected the presence of foreign body with hypoechoic ring and demonstrated reverberation artifact which was suggestive of glass particles in the sutured wound.

Therapeutic Intervention

With help of USG it was easy to localize the foreign body and to define the relationship with soft tissues. Wound was re-explored and glass particles along with necrotic tissue were removed (Fig 3b). Within a short period of time wound healed uneventfully, except for the presentation of slight scarring over the area (Fig 3c).

Follow up and outcomes

Patient was in a regular follow up for the past six months and the wound was perfectly healed in the last visit.

Fig: 3(a, b, c)

Fig 3a: Patient at the time of presentation, 3b: Glass particles retrieved, 3c: healed surgical site

Case Report: 4-Osteoradionecrosis following extraction

Summary

Osteoradionecrosis (ORN) is one of the most serious oral complications occurring in the head and neck cancer treatment.ORN is an exposure of non-viable, non-healing, non-septic lesion in the irradiated bone, which fails to heal without intervention.Although ORN

lesions may be infected, this is usually a secondary event to the true pathophysiologic process of radiation necrosis[19]. Osteoradionecrosis is one of the common consequences of irradiation induced tissue injury.Pain, drainage and fistulus tract in mucosa or skin that has been irradiated are the common clinical manifestations of ORN[20]. This case report highlights the need of proper post radiation treatment protocol needed for extraction and other surgical procedures in maxillofacial area.

Patient information

A 77year old female patient reported to our department with complaints of pus discharge in the lower right back tooth region since three and a half years. Patient was diabetic, dyslipidemic and was also under psychiatric medication.

History of Presenting illness and clinical examination

Patient had a history of breast cancer four year back (T2N2M1), for which she had undergone radiation and chemotherapy. Dental extraction of 47 was done 3 months after the radiation therapy. Since then she gives a history of continuous pus discharge from the extraction socket (Fig 4a).On examination, non-healing extraction site was seen in relation to 47 with pus extruding from the extraction socket with obliteration of buccal vestibule and erythematous swollen area from 45 to 48. Paraesthesia in relation to lateral one third of right lower lip was reported. The site was non tender on palpation.

Diagnostic Assessment

The pus was sent for culture and sensitivity, which revealed presence of aerobic streptococcus viridian's species (alpha haemolytic). Routine blood examinations revealed a slight elevation in creatinine level. CRP was elevated slightly. An OPG (Fig 4b) was also taken which showed moderate bone loss in relation to extraction site. CT mandible revealed ill-defined oblong area of mixed sclerosis and intramedullary lucency involving the body of mandible on right side with cortical defects and sequestrum.

Therapeutic Intervention

Patient was given ampicillin 500mg, 6 hourly for 7 days, pentoxifyllin 400mg three times daily, and tocopherol 1000 IU daily therapy on long term basis. But even after long term medical management, symptoms didn't subside, hence sequestrectomy was done under GA. Prior to surgery,saline plus betadine irrigation 1:1 ratio and Inj Accuzone plus 1.5g IV BD + Tab Pentoxyfilline 400mg TID + Cap Evion 600mg BD for one week. Daily irrigation reduced the pus discharge. Periodic follow up is being done since then and the surgical site is in healing stage (Fig 4c and 4d).

Follow up and outcomes

Periodic follow up is being done since then and the surgical site is in healing stage.

Fig: 4 (a, b, c, d)

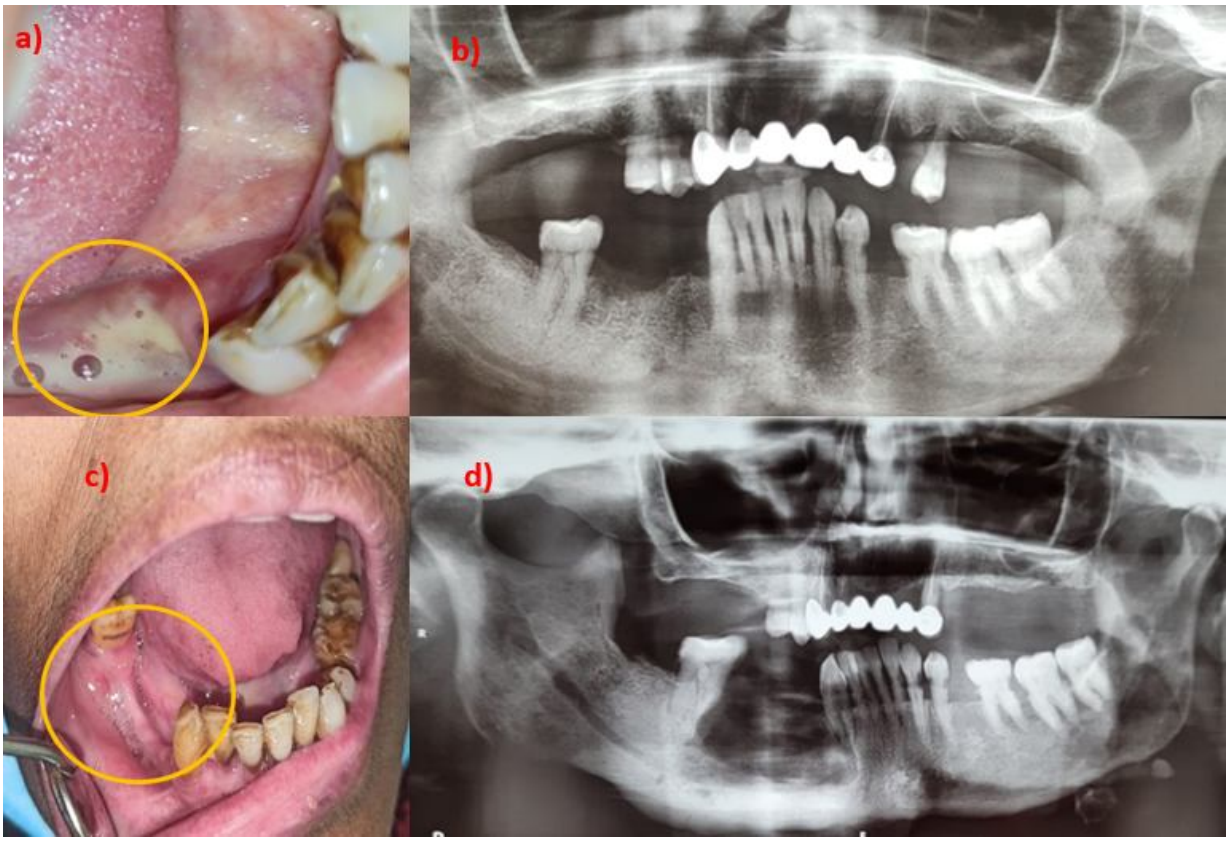

Fig 4a: Pus from the extraction site, 4b: OPG one month after extraction, 4c: healed surgical site after sequestrectomy, 4d: Post Op OPG

Case report: 5- Non healing extraction socket

Summary

If the symptoms for which extraction is performed do not resolve completely or if the extraction socket fails to heal, there is obvious chance for underlying pathology. This is yet another case which shows failure of an extraction socket to show adequate signs of healing in a timely manner.

Patient information

59 year old male patient with complaints of pain in the lower right back tooth region since two months with occasional pus discharge from the area reported to our outpatient department. The patient was not having any known systemic comorbidities.

History of Presenting illness and clinical examination

He gave a history of extraction of 48 in the same area two months back. The extraction procedure was normal (Fig 5a and 5b). The healing was uneventful. Two weeks later occasional pus discharge was noted from the adjacent tooth with pain. Patient consulted a local dental clinic from where antibiotics and analgesics were prescribed. The

symptoms declined initially but later on the symptom aggravated and hence the patient reported our outpatient department.

On examination there was a sinus opening in relation to 47 with pus discharge. 47 was having grade one mobility and was tender on percussion. It was diagnosed to be periodontal abscess in relation to 47. Extraction of 47 was done uneventfully and the post-operative bleeding was within normal limit. But the post extraction healing was not satisfactory. There was purulent discharge from the extraction site with outgrowth of proliferative soft tissue mass from the extraction socket.

Diagnostic Assessment

All the routine blood examinations were performed. All the blood parameters were within normal limits. Pus was sent for culture and sensitivity. A biopsy was performed which showed dysplastic stratified squamous epithelium invading in to underlying connective tissue in the form of sheets and cords which was compatible with squamous cell carcinoma (Fig 5c).

Management

Patient was referred to our oncosurgery unit, where further test were done and was diagnosed with T2N0M0 squamous cell carcinoma. He had undergone segmental resection with prophylactic neck dissection, followed by secondary reconstruction.

Fig: 5(a, b, c, d)

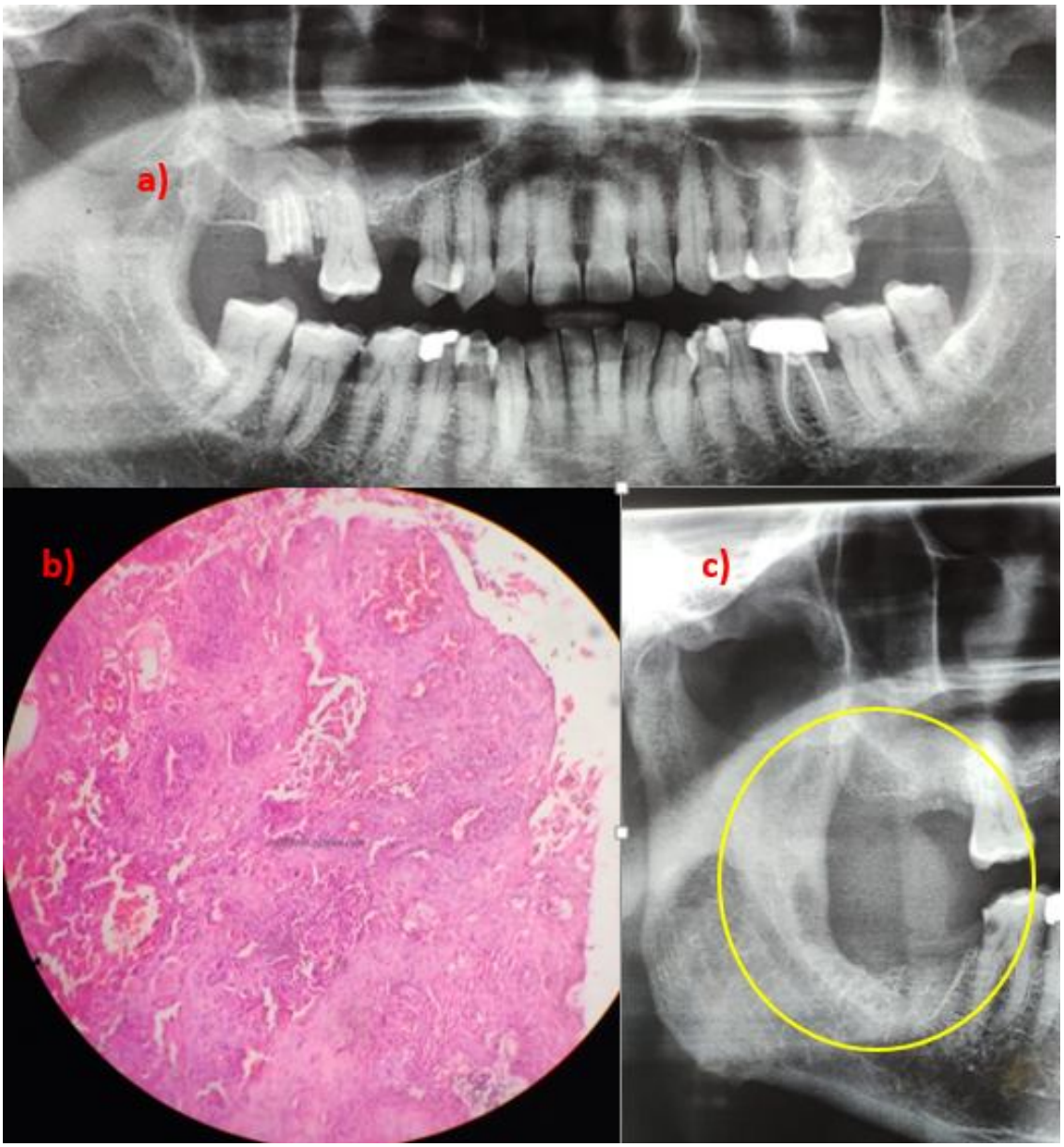

Fig 5a: OPG before extraction of 47, 48; 5b: Histopathological section of biopsy material; 5c: OPG after extraction of 47, 48

Follow up and outcomes

Periodic follow up is being done for every 6 months since then with USG head and neck.

DISCUSSION AND CONCLUSION

Five cases of delayed and non-healing wounds were presented.The first case report highlights the need of a proper history, clinical examination, and investigation and referral system for wounds which fail to heal by conventional treatment modalities. The B lymphoblastic leukaemia is a type of leukaemia which affects B lymphocytes. It is the most common type of all. It is an aggressive type of leukaemia with very low prognosis. Although in most cases it cannot be cured, early diagnosis and treatment can help the patient live

longer and better[3, 4, 5]. According to Lynch and coworkers[6]any type of extractions are contraindicated in patients suffering from leukaemia. Thoma and co-workers was of the view that surgery in leukemic patients may result in the breakdown of wounds, which may result in profuse bleeding. They further stated that extractions should be performed in such patients only if no other alternatives available." Zegarilli and Kutscher were also of the view that oral surgical procedures are usually contraindicated.[8] Little and Falace stated that those patients in the acute states of leukaemia should not be taken for oral surgical procedures[9].
The second case report highlights the need of adequate oxygen tension, role of Hb and antibiotic sensitivity in healing process. Sandblom, [10] in a study performed on rabbits found that anaemia produced by post-surgery blood loss and if the volume not replaced might led to a significant reduction in wound healing. According to Sandberg anaemia induces delayed healing probably mediated by a depression in oxygen delivery to the wound area[11]. Reduced Hb levels tend to decrease the oxygen level in the developing granulation tissue. Collagen accounts for the strength of the wounds and oxygen is one of the major requirement of collagen synthesis. The energy requirement of the cellular events in wound healing requires ATP, which purely depends on oxidation. Thus the rate limiting factor for collagen synthesis is local bioavailability of oxygen[12, 13]. Ferrous ion which serves as a co-factor in the enzymatic hydroxylation of proline and lysine in protocollagen.[14] So iron deficiency significantly limit the production of mature collagen which is essential for healing.The gravity of antibiotic resistance in wound care is well established. Majority of non-healing post-operative wounds show multiple bacterial strains which are resistant to common antibiotics. In such cases, repeated cultures and sensitivity test is a vital tool to monitor the emergence of resistant strains[7].

Wounds of the face and those caused by RTA are more likely to harbor retained foreign bodies such as earth and glass particles.[17,18] Hence at the time of primary care of the wound itself due attention should be given for the cleaning and debridement of the wound. In those instances when the patient has a sensation of foreign body retention or when the wound healing is altered or when there is signs of infection / inflammation consideration should be given for radiograph and/or USG. The third case report highlights the need of thorough debridement of wounds prior to closure.

Extractions are contraindicated for at least 6 months after radiation therapy[19].So prior to radiation therapy proper intraoral examination should be done and the teeth with poor prognosis should be extracted before radiation therapy. An incidence of extraction within 6 months after radiation potentiate the risk of ORN. Recent understanding of the pathophysiology of ORN based on the concept of radiation-induced fibrosis has led to the formulation of novel therapeutic regimens composed of pentoxifylline and tocopherol. Pentoxifylline have a significant role in fibroblast proliferation and extracellular matrix (ECM) production. Pentoxifylline and its metabolites remarkably improve blood flow by decreasing its viscosity and enhance microcirculation and tissue oxygenation. Usually 400 mg dosage of pentoxifylline in extended-release tablet form three times a day is recommended. The effect of pentoxifylline is evident within 2 to 4 weeks; it is recommended that treatment must be continued for at least 8 weeks[21]. Since the patient was not responding to drug therapy surgical management was done which resulted in resolution of the condition.

If the symptoms for which extraction is performed do not resolve completely or if the extraction socket fails to heal, there is obvious chance for underlying pathology[22].Failure of a lesion to show adequate signs of healing in a timely manner, is very common when risk underlying oral SCC are present as seen in case report 5. Such cases cannot be diagnosed by a clinical examination. This warrants prompt referral to an oral and maxillofacial surgeon for proper evaluation and biopsy if required[23].

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