Case Report

Simultaneous Occurrence of Periodontal and Skin Abscesses in a Nigerian Girl: Case Report

Dosumu E.B, Bankole O.O and Dosumu O.O

Department of Periodontology and Community Dentistry, College of Medicine, University of Ibadan, Nigeria
Department of Child Oral Health, College of Medicine, University of Ibadan, Ibadan, Nigeria.
Department of Restorative Dentistry College of Medicine, University of Ibadan, Ibadan, Nigeria.

ABSTRACT

We report a case of a girl with a perplexing clinical feature of simultaneous occurrence of periodontal and skin abscesses that resolved following periodontal therapy. Infections and inflammations have the capacity to metastasize and despite the localized nature of periodontal disease, infection of the sulcus/periodontal pocket can lead to inflammatory responses beyond the periodontium. C-Reactive Protein (CRP) is primarily a non-specific marker of inflammation with multiple pro-inflammatory properties and some studies have noted its concurrent reduction and CVD following periodontal therapy. A 12 year old Nigerian girl presented clinically with simultaneous occurrence of aggressive periodontitis, periodontal and skin abscesses with eventual teeth loss. Pre-operative quantitative analysis of plasma CRP was 1500mg/l, moderate growth of *Staphylococcus aureus* and *Porphyromonas gingivalis* were isolated from the skin and periodontal pus respectively and basic hematological values were within normal range. Intensive non-surgical periodontal therapy was done at intervals of two months complemented with high dose of Amoxicillin and Metronidazole for seven days. The periodontal condition resolved, skin abscesses healed with scarring and the removable acrylic partial dentures delivered improved the patient’s appearance and eventual overall quality of life. This case may suggest a possible link between periodontal and skin disease because of the resolution of these conditions and concurrent lowering of the serum level of CRP following periodontal therapy. Periodontal disease may be implicated as an etiology of the skin abscess because of the resolution of these disease conditions following periodontal therapy.

**Key words**: Case report, Periodontal abscesses, Skin abscesses, CRP, Non-surgical periodontal therapy, Resolution

BACKGROUND

Inflammatory disorders/diseases (local and systemic) can simultaneously occur or may develop sequentially where progression or exacerbation of one disease may affect the second disease (Van Dyke et al 2013). Despite the localized nature of periodontal disease, infection of the sulcus/periodontal pocket can lead to inflammatory responses beyond the periodontium (Van Dyke et al 2008). Infections and inflammations have the capacity to metastasize (Chiang et al 2013) and periodontal disease is an inflammatory disease induced by a microbial biofilm. (Loe et al 1965) There is an established assumption that periodontitis is an infection that causes inflammatory disease that metastasizes (bactereamia and infection) at non-oral sites. From the understanding of the biology of a relationship between periodontitis and systemic disease, it is clear that this relationship is not
linear, but complex (Van Dyke et al 2013) Bacteria and inflammatory mediators may enter the blood and disseminate systemically and have a measurable impact on systemic inflammation.

Epidemiological evidence linking periodontitis to the progression of systemic disease such as cardiovascular disease, adverse pregnancy outcomes and diabetes mellitus is associated with both bacteraemia and elevated levels of various markers of systemic inflammation (Kinane et al 2005). Non oral infections linked with systemic infections described over a decade ago among others include endocarditis, lung infections, liver and brain absceses (Van Winkelhoff et al 1999). Bacteraemia is aggravated more by mechanical means during toothbrushing, chewing, oral examination, endodontic treatment, scaling and root planning (Kinane et al 2006, Debelian et al 1995). Pro-inflammatory mediators such as IL-β, IL-6, TNF-α and PGE2 produced locally in the inflamed gingival tissues may “spill” into the circulation and have systemic impact such as introduction of endothelial dysfunction (Amars Gokce et al 1995, Elter et al 2006). C - reactive protein (CRP) has multiple pro-inflammatory and pro-atherogenic properties and it remains established as a marker of cardiovascular disease (CVD) risk. CRP is primarily a non-specific marker of inflammation and some studies(Van Dyke et al 2007, Van Dyke et al 2008,Van Dyke et al 2003) noted the concurrent reduction of CVD following periodontal therapy with similar reduction in key mediators of systemic inflammation. Ideally, following inflammation there should be rapid and complete elimination of leucocytes; inadequate resolution and failure to return tissue to homeostasis results in neutrophil mediated destruction and chronic inflammation with matrix and tissue scarring and fibrosis (Montebugnoli et al 2005, Taylor et al 2006, Hussain et al 2009 ). Although clinical proof of causality is elusive, it is clear that the three aspects of the pathogenesis of periodontal disease; infection, inflammation and adaptive immunity, all have a periodontal role and impact on the systemic inflammatory immune response that either initiates or mediates a wide range of systemic diseases. (Montebugnoli et al 2005)

Some surveys also showed that severe alveolar bone loss and loss of multiple teeth in children is less than that in young adolescent (Vidal et al 2009, Nakkjima et al 2010, Perry et al 1990) it is however revealed that while chronic periodontitis is commoner in adults, aggressive periodontitis may be commoner in children and adolescents (Loe et al 1991). Genetic /hereditary linkages with aggressive periodontitis have also been shown (Oliver et al 1998) and various neutrophil functional defects were reported in localized aggressive periodontitis (LAGP) patients but the influence on the susceptible individuals is unknown because these defects may still be present in these group of patients after treatment (Armitage et al 1999, Hart et al 1997).

Successful treatment of localized aggressive periodontitis mostly recommended by some authors is a combination of surgical or non-surgical root debridement depending on early diagnosis and provision of an enabling environment that is free of infection (Daniel et al 1996, Dennison et al 1997). It is reported that scaling, root planning and photodynamic therapy have similar effects on crevicular TNF –Xs and RANK L (receptor activator of nuclear factor-kappol BL) level in aggressive periodontitis patients (Dennison et al 1997). Microscopic culture of plaque samples from generalized aggressive periodontitis (GAP) patients who do not respond to standard periodontal therapy may be required to identify the susceptibility of the periodontal pathogen (DeOliveire et al 2009). It is shown that failure to treat aggressive periodontitis appropriately can result in progressive and often rapid loss of periodontal supporting tissues and eventual tooth/teeth loss (Van Winkelhoff et al 1996). Papapanou et al (2000) and Locker djokovic (2010) reported that children with oligodontia experienced substantial functional and psychosocial impact from this condition that is more severe, than the impact of caries and malocclusion.

The diagnosis of periodontal abscess should be based on the overall evaluation and interpretations of the chief complaint in conjunction with the clinical and radiological findings (Locker et al 2010). Pure mechanical debridement with either surgical drainage through the periodontal pocket or scaling and root planning (SRP), debridement of the soft tissue wall and systemic antimicrobial therapy are recommended for the management of periodontal abscess (Colbet et al 2004). None of the antimicrobials are able to resolve the infections entirely which implies that mechanical debridement and sometimes surgical therapy have to be used and the recommended general principle of systemic antimicrobial administration is a high dose delivered during a short period of time while resistant strains are also reported (Colbet et al 2004, Herrera et al 2005). Periodontal therapy (scaling, root planning and antibiotic treatment) has been shown to reduce levels of some inflammatory and acute phase markers which further implicates the periodontium as a source of systemic inflammatory mediators such as CRP, TNF-α and IL-6 (Jaramillo et al 2005). Full mouth extraction in patients with advanced periodontitis showed significant reduction in CRP, plasminogen-activator-inhibitor-1 fibrinogen and WBC (Zaoutis et al 2006).
It is reported that the incidence of skin and soft tissue infections has rapidly increased over the past decades following the emergence of methicillin-resistant staphylococcus aureus (MRSA) (Silva et al 2011). MRSA are suggested to be the most common cause of skin and soft tissue infections with identifiable risk factors which are not clinically useful (Boggs et al 2011). The prevalence of MRSA is reported to have geographical and demographic variations (Fridkin et al 2005). Skin and soft tissue abscesses, especially skin abscesses require urgent evaluation for potential incision and drainage and antimicrobial therapy (Pallin et al 2008, Hersh et al 2008). Only few evidence-based consensus guidelines exist for the management of cutaneous abscesses (Stevens et al 2005). Routine use of antibiotics is only indicated in patients with draining cutaneous abscess that have surrounding cellulitis (Gorwitz 2008) and the all-inclusive routine culturing minimally (or not all) alter patient management (Abrahamina et al 2007, Baumann et al 2011).

CASE DESCRIPTION

A.K is a Nigerian female child aged 12 years brought by her mother to the Dental Center, University College Hospital, Ibadan seeking management of a condition which the mother claimed looked strange to her. Informed consent was obtained from the mother and patient. The chief complaints were very mobile teeth and abscesses around the teeth with eventual exfoliation of all the deciduous and permanent teeth except the few standing teeth that the patient presented with which were also very mobile and concurrent skin abscesses on the scalp, neck and limbs (Plates 1,3 & 4 ). The mother reported no pre-natal problems nor intake of any special medication during the patient’s pregnancy period. No systemic problems such as diabetes, blood dryscrasias, cardiopathy or allergic responses to any product or medication were detected after series of related clinical investigations. Microbiological findings from the pus of the skin and periodontal abscesses showed moderate growth of gram positive cocci (staphylococcus aureus) and gram negative rods (predominantly Porphyromonas gingivalis) respectively which were both sensitive to amoxicillin and metronidazole & the quantitative analysis of the plasma CRP level was 1500mg/l. Basic heamatological findings were all within normal range and dermatological examination showed multiple abscesses on the scalp, neck and limbs with patched areas of healed lesions. Extra-oral clinical examination revealed obviously disturbed and anxious young girl with bilaterally depressed medial canthus of the eyes and loss of fullness of the cheeks secondary to missing teeth while intra oral clinical examination showed partial edentulosity of the four arches (figure 1). The teeth present were:

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All the teeth present were mobile with degree of mobility ranging from Milhar mobility index grades II and III. These teeth also had periodontal abscesses with pus discharge through the gingival sulcus. Multiple scalp abscess and scaring did not affect hair growth (figure 5). There was no carious tooth and the gingivae were not inflamed but there was oral malodour because of the pus discharge and moderate accumulation of plaque and calculus. Periapical radiographs of the teeth with Milhar mobility index III showed gross alveolar bone loss with areas of vertical defects and diagnosis of chronic periodontal abscess were made based on these clinical and radiological findings.

The initial phase of dental treatment given included professional prophylaxis, scaling and root planning, basic instructions on oral hygiene and the use of 0.12% chlorhexidine mouth rinses. No tooth was extracted, except the seemingly” hope less” teeth ( lower right and left canines and first molars and the upper left first molar (Fig 2) which eventually exfoliated. Hydrogen peroxide solution, normal saline and 0.12% chlorhexidine gluconate were used for the periodontal debridement and the patient was simultaneously placed on an antibiotic regimen of Amoxicillin capsules 250mg 8 hourly and metronidazole 200mg 8 hourly for seven days. The periodontal debridement therapy with 0.12%
chlorhexidine gluconate was intensified around these teeth and repeated at regular period interval of two months for one year which arrested periodontal disease progression, skin lesions also healed with scars and the plasma CRP level also reduced to 15mg/l. At this stage, upper and lower functional removable acrylic partial dentures replacing the missing teeth were then fabricated and inserted (figures 6). Consequent to the inserting of the partial dentures, partial periodontal stability of the teeth and healing of the skin lesions even with scarring (figure 7), the patient’s appearance, psychosocial and emotional status were enhanced as evidenced by her hyperactivity in the class as reported by her class teacher.

The patient kept the maintenance follow-up visits every four months during which scaling, root planning and periodontal debridement are done and no tooth has been lost after wards. The dentures still fit because there has been no evidence of progression of the disease, such as acceleration for residual ridge resorption, which facilitates adaptation of the prosthesis and masticatory function and the dentures were well tolerated by the patient.
Case report on combined periodontal and skin Abscess occurrence

DISCUSSION

This report is a case of a 12 year old female patient with multiple periodontal and skin abscesses appearing simultaneously coupled with exfoliation of several of her teeth before presentation at the clinic.

The early sign of this aggressive periodontitis in this patient by affectation of the deciduous teeth supports the findings of (Specktor et al 1985 and Sjodin et al 1993). Haematological investigations in this patient did not reveal any blood dyscrasias or defects which may account for the cessation of progression of the periodontal disease after treatment, which supports the reports of (Daniel et al 1996) and Dennison et al (1997). The simultaneous resolution of the skin and periodontal abscesses may be in keeping with the findings of (Montebugnoli et al 2005, Taylor et al 2006, Herrera et al 2005 and Jaramillo et al 2005): that periodontal therapy reduces plasma CRP level and subsequent infection resolution. The keeping of maintenance follow-up visits for periodontal therapy by the patient would have provided an enabling environment that is free of infection which led to a successful periodontal treatment. Systemic administration of the antibiotics that the isolated microorganisms were sensitive to may have also contributed to the good response to therapy. The initial progressive loss of periodontal supporting tissues in this patient may be due to failure to treat the condition at that time which is reported in some studies (Dennison et al 1997, Van Winkelloff et al 1996). This patient exhibited substantial functional and psychosocial impact on her quality of life both at home and in school which was evident by her look of fear and anxiety at initial presentation in the clinic. This supports the findings of Locker et al 2010 that children with oligodontia experienced substantial functional and psychosocial impact from this condition that is more severe, than the impact of caries and malocclusion.

The patient was placed on high dose of antimicrobials for a short period of seven days to compliment the non-surgical periodontal therapy and regular mechanical debridement in line with the suggestions of Jaramillo et al 2005 and Herrera et al 2005. Microscopy culture and sensitivity of pus from the skin abscesses showed moderate growth of staphylococcus aureus that is sensitive to Amoxicillin which the patient responded to leading to healing of the skin lesions although with scarring.

In conclusion, this is a perplexing clinical entity because of its unusual simultaneous occurrence of aggressive periodontitis, periodontal and skin abscesses which had a good treatment outcome both of the periodontal and skin diseases and lowering of CRP following regular mechanical debridement and short duration high dose antibiotics. This case may suggest a possible link between periodontal and skin disease.

Clinical significance: Possible link between periodontal disease and skin disease because of the marked lowering of serum CRP following non-surgical periodontal therapy. Periodontal disease may be implicated as an etiology of the skin abscess because of the resolution of these disease conditions following periodontal therapy.

REFERENCES


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