Early stage of necrotizing Fasciitis of Odontogenic Origin in non-Immunocompromised Patient- An Atypical case report

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ABSTRACT

Necrotizing fasciitis of the head and neck is a rapidly spreading, polymicrobial superficial infectious disease spreading along fascial planes leading to necrosis of tissues with sparing of muscles and bone. It is a very rare but life-threatening infection with high mortality rate commonly literature in the extremities, abdominal wall, and perineum but rarely seen in the head and neck. We report a rare case of early stage of necrotising fasciitis in 53 year old non-immunocompromised patient involving right facial region having odontogenic origin and which was first diagnosed as a multiple space infection preceded by periapical abscess from a carious tooth. The diagnosis of Necrotising fasciitis must always be considered in a patient who presents with a history of oral infection with evidence of rapid spread facial swelling with pain. Delay in diagnosis is believed to be the most likely reason for the high mortality rate.

Keywords: Hospital gangrene, Infections, Necrotising fasciitis

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INTRODUCTION

Necrotizing fasciitis of the head and neck is very rare, rapidly spreading superficial infection spreading along fascial planes leading to necrosis of tissues involving fascia, superficial fat, overlying skin and blood vessels with sparing of muscles and bone which is a characteristic feature.[1] It is a polymicrobial, soft tissue infection characterized by the formation of large necrotic lesions and gas, located in the subcutaneous tissue and superficial fascia.[2] It most commonly occurs in the extremities (leg 33%, hand 7.5%),[3] trunk, genitalia and peritoneum (20.2%). Due to the great vascularity of head and neck regions which makes the tissue less susceptible to ischemia and infarction, it is less common in these regions (cervical 5.3%), but when occurs dental infection is the frequent cause.[4]

Hippocrates first described Necrotizing fasciitis in 5th century B.C; he described this as a complication of erysipelas.[5] It was also known as the malignant ulcer, phagedenic ulcer, phagedena ("eating away"), gangrenous ulcer, putrid ulcer in the early 19th century.[6,7] Sir Gilbert Blane, Thomas Trotter and Leonard Gillespie British naval surgeons described necrotizing fasciitis in detail in late 18th century. It was called as "hospital gangrene" by Jones in 1871 which was its first description in United States. From the 1780s through the 1850s, it was known as one of the most dreaded disease to happen those serving in the army and navy in England.[6] Pfanner in 1918 described it as a "necrotizing erysipelas", but to describe tissue death and associated fascial plane involvement which is characteristic of the disease, Wilson coined the term 'Necrotizing fasciitis' in the year 1952.[6-8]

Destructive, Rapid clinical course of this disease is assumed to be caused by multimicrobial symbiosis and synergy.[9,10] Patients associated with immunocompromised conditions (cancer, diabetes mellitus, organ transplantation or alcohol abusers) usually affects because of monomicrobial infection.[11] Many aerobic and anaerobic pathogenic microorganisms may be involved in pathogenesis, The most common microorganisms involved are Staphylococcus aureus, Streptococcus hemolyticus β group A, Enterobacteriaceae, Clostridium and

Salmonella.[12,13] Necrotizing fasciitis having odontogenic origin is rare although it has been reported in the some literature.[2,8,13] Mainly its diagnosis depends on clinical features which are not all the time observable, that is why the disease is often diagnosed late in its line of course, for this reason it is having high mortality rates (19% to 40%).[14] The patient with necrotising fasciitis usually becomes toxic, frequent requirement of critical care support, with having potential for severe aesthetic deformity and death if inappropriately treated in a timely manner without aggressive medical and surgical intervention.[8,15] The treatment for necrotizing fasciitis necessitates meticulous surgical debridement of the necrosed tissue.[16]

This paper presents a rare case of facial necrotising fasciitis in 53 year old non-immunocompromised patient involving right side of face initially suspected to be space infection having odontogenic origin.

CASE REPORT

A 53 year old male patient reported to the Dept. of Oral Medicine & Radiology with the complaint of swelling and discharge in the right lower and middle one third of the face for the past one week [Figure 1].

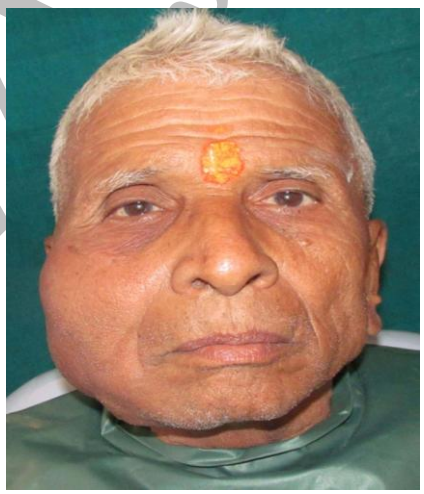

Figure 1: Photograph of Swelling over right cheek of Patient's

The patient also presented with complaint of reduced mouth opening. He had not consulted any physician before and had taken medications from local chemist to relieve pain but the pain persisted. Patient also gave a history of decayed

tooth with pain in lower right posterior region. There was no significant medical history or any immunocompromised condition except occasional alcohol habit. Patient's physical examination was unremarkable and his vital signs were as follows, BP-110/70 mm Hg, pulse-80 beats/min, respiratory rate-15 cycles/min and patient was febrile with Temperature - 102^0 F.

Examination of the site revealed a diffuse swelling on the middle and lower third of right side of the face extending from tragus till the ala of nose anteroposteriorly and outer canthus of the eye till 4 cm below the lower border of the mandible towards the upper part of the neck supero-inferiorly. Approximately 12.5x13 cm in size [Figure 2, 3].

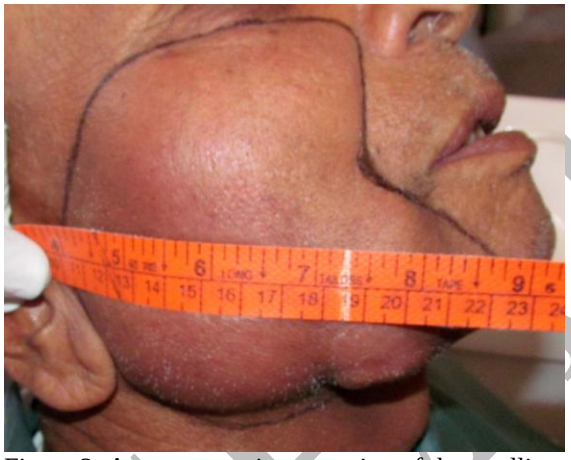

Figure 2: Antero-posterior extension of the swelling

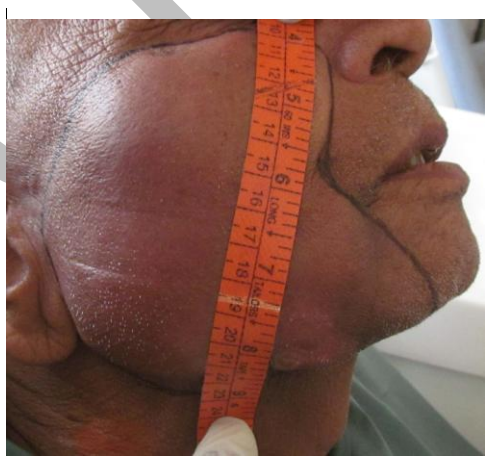

Figure 3 : Supero-inferior extention of the swelling

Skin over the swelling was slightly stretched, shiny, slight erythematous appearance. There were areas of healing extraoral draining sinuses noted below the inferior border of mandible, surrounded by areas of erythema [Figure 4]. Patient gives a history of recurrent pus discharge from the same region. On palpation there was a local rise temperature and soft in consistency and tender. Both sided submandibular lymph nodes were palpable and tender.

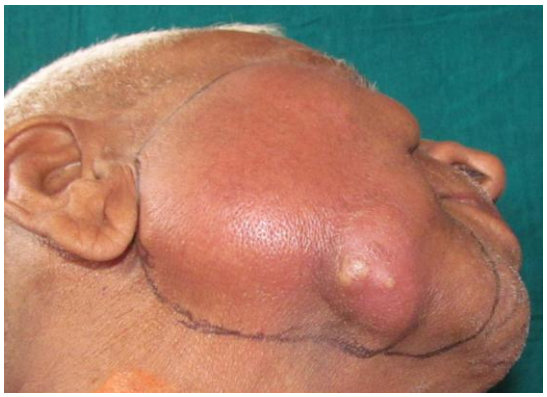

Figure 4 (Healing extra-oral draining sinuses below the inferior border of mandible)

Intraoral examination showed reduced mouth opening around 12 mm [Figure 5] with foul odour.

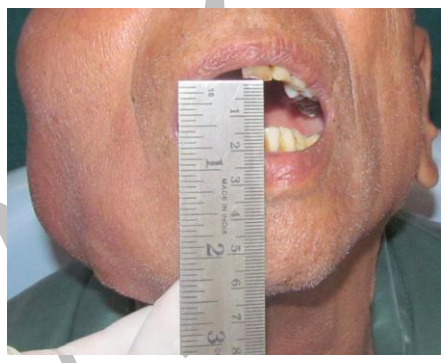

Figure 5 : Reduced mouth opening; about 12 mm

Patient was having missing teeth, fractured left maxillary anterior tooth with discolouration and cariously destructed right mandibular second molar which was tender on percussion and having grade I mobility [Figure 6, 7].

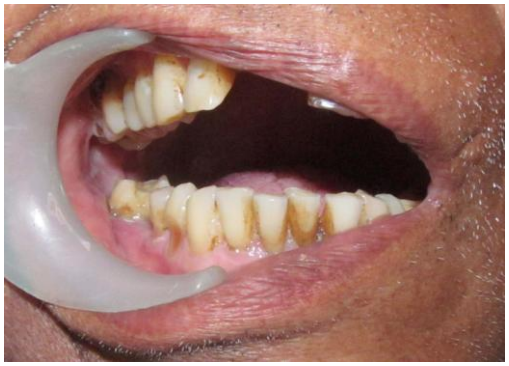

Figure 6: Intra-oral examination;

Right side showing carious tooth

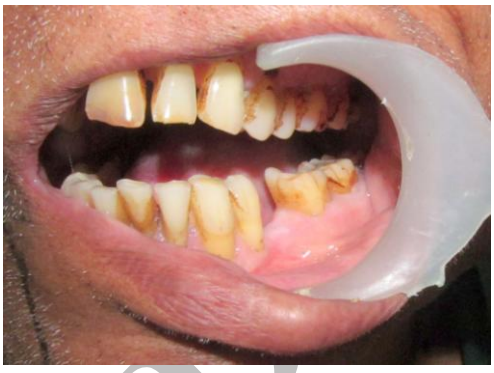

Figure 7: Intra-oral examination; left side

A radiographic investigation (Lateral oblique view of right side) was carried out to confirm the source of infection which concludes to the cariously destructed mandibular second premolar and molar with periapical abscess, [Figure 8].

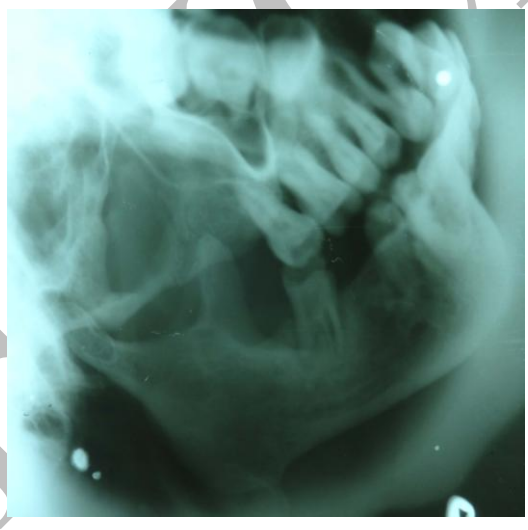

Figure 8: Lateral oblique view of right side cariously destructed mandibular teeth

Blood investigations with Blood sugar level were normal except slightly elevated leucocyte count. The culture of collected fluid showed presence of aerobic and anaerobic streptococci and staphylococci along with Gram-negative species. Initial diagnosis of multiple space infection involving right sided infraorbital, buccal and submessetric space was made on the basis of examination and investigations.

In treatment, under local anaesthesia and broad spectrum antibiotics (Tab. Augmentin 625 mg TID & Tab. Metrogyl 400 mg TID) Extraction of offending tooth was done. Within his six visits to our hospital patient was treated by repeated drainage of pus by putting rubber drain through multiple extraoral local incisions at submandibular, preauricular and submental region and inraorally upper and lower buccal incision and single incision at ascending border of ramus [Figure 9, 10, 11]. At first and second visit frank pus accounting of around 70-80 ml was drained. Third visit onwards thin dead slurry-like brownish white necrotic fascia with foul yellowish brown dishwater-like thin fluid was removed from the site, which concluded to the diagnosis of Necrotising fasciitis involving right side of face. The drained fluid with necrosed tissue was sent for the histopathological examination and patient was recalled for follow up.

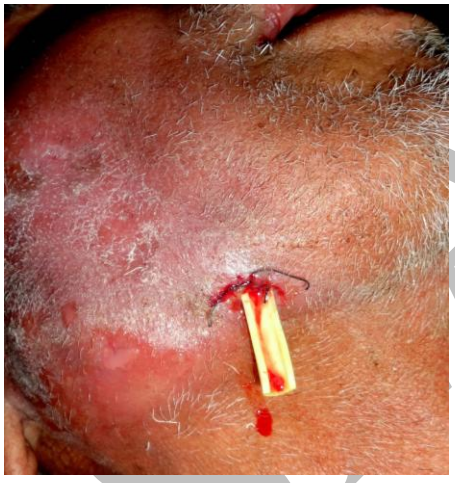

Figure 9 (Treatment: Drainage of Pus and dishwater like fluid by putting rubber drain through multiple extraoral local incisions)

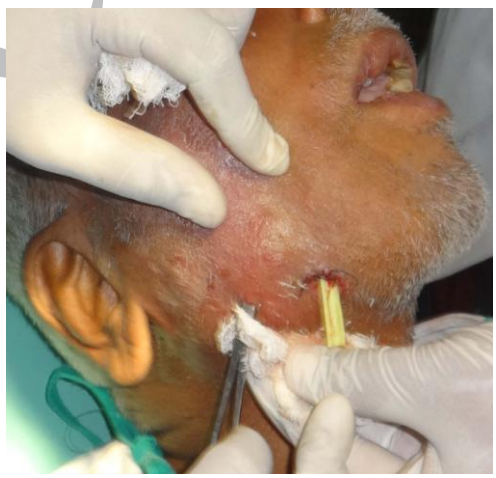

Figure 10 (multiple extraoral local incisions)

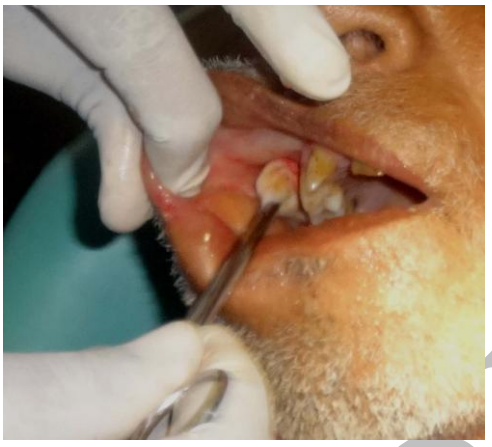

Figure 11 (Intraoral upper buccal incision)

DISCUSSION

Necrotising fasciitis is a rare disease in the head and neck region. The most common cause is an infection of odontogenic origin followed by tonsillar infections and pharyngeal infections.[17] It was first described in the year of 1848; 20 cases of necrotising fasciitis were recognized in China by Meleney in 1920.[14] Patients having immunocompromised conditions like cancer, alcoholism, diabetes mellitus, HIV, malnutrition, or severe liver diseases are prone to necrotising fasciitis,[14,18] but in present case patient was not immunocompromised. It depicts the rare representation of necrotising fasciitis of facial region in non-immunocompromised conditions. The hyperglycaemic condition in the diabetic patient impairs normal function of leukocytes and contributes to host's immune suppression, which leads to diabetic patient more susceptible to exacerbation of a usual odontogenic infection and so are more likely to develop the disease.[14,15] Like in present case, majority of necrotising fasciitis cases involving the head and neck follows dental or oropharyngeal infection.[14] Necrotizing fasciitis having odontogenic origin takes the common path of spread and invades deeper tissue planes in an early stage. This can be ambiguous to unsuspecting clinician and makes the early diagnosis difficult.[19]

However some clinical findings may present like Odontogenic infection that spreads to neck; unusual accumulation

of gas; rapid progression of infection; leading to the overlying tissue edema (peau d' orange edema).[20] Subcutaneous crepitus may be observed which were also seen in our case. If there is high suspicious manifestation of disease, clinical diagnosis of NF can be made by early surgical exploration to confirm the diagnosis and to execute appropriate debridement of the disease.[7,8]

For the early diagnosis of this disease computed tomography is the most helpful imaging modality and is excellent in the recognition of the presence of soft tissue gases in the deep spaces but plain radiographs are also helpful in detection of odontogenic source of infecion and air foci as we have done in present case.[4] Once NF is diagnosed treatment should be institution of broad spectrum antibiotics, surgical debridement with drainage, frequent monitoring, and wound checks. Foul dishwater like thin fluid will often be drained which was also present in our case.[4]

According to recent studies an adjunctive therapy like fluid and electrolyte replacement, hyperbaric oxygen (HBO therapy), and intravenous immunoglobulin G will improve the surgical outcomes and lessen the mortality rates. Hyperbaric oxygen causes wound healing faster and a decrease in bacterial numbers.[14,15,21,22]

CONCLUSION

The diagnosis of Necrotising fasciitis must always be considered in a patient who presents with a history of oral infection with evidence of rapid spread facial swelling with pain specially with immunocompromised conditions like cancer, alcoholism, diabetes mellitus, HIV, malnutrition, or severe liver diseases which are prone to cause the disease but as seen in our case non-immunocompromised patient should also be considered for the diagnosis of Necrotising fasciitis and should be treated promptly. Delay in diagnosis is believed to be the most likely reason for the high mortality rate.

REFERENCES

1. Ndukwe KC, Fatusi OA, Ugboko VI. Craniocervical necrotizing fasciitis in Ile-Ife, Nigeria. *British J Oral Maxillofac Surg* 2002; 40:64-67.
2. Umeda M, Minamikawa T, Komalusubara H et al., Necrotizing

Fasciitis caused by dental infection : a retrospective analysis of nine cases and a review of the literature. *Oral Surg Oral Med Oral Path Oral Radiol Endol* 2003; 95:283-290.

3. Shaikh N. Necrotizing fasciitis: A decade of surgical intensive care experience. *Indian J Crit Care Med* 2006; 10:225-9.
4. Shobha Basavaraj Sikkerimath et al, *Journal of Indian Academy of Oral Medicine and Radiology*, April-June 2013; 25(2): 00-00.
5. Descamps V, Aitken J, Lee MG. Hippocrates on necrotising fasciitis [letter]. *Lancet* 1994; 344:556
6. Loudon I. Necrotising fasciitis, hospital gangrene, and phagedena. *Lancet* 1994; 344:1416-19
7. Green RJ, Dafoe DC, Raffin TA. Necrotizing fasciitis. *Chest* 1996; 110:219-229.
8. Sameer AC et al. Necrotizing Fasciitis of Odontogenic Origin in a Non-
9. Immunocompromised Patient- A Rare Case Report. *Al Ame en J Med Sci* (2011) 4 (3):2 9 0 -2 9 4.
10. Morgan MS: Diagnosis and management of necrotizing fasciitis: A multiparametric approach. *J Hosp Infect* 2010, 75:249-257
11. Levine EG, Manders SM: Life-threatening necrotizing fasciitis. Clin in Dermat 2005, 23:144-147.
12. Urschel JD, Takita H, Antkowiak JG. Necrotizing soft tissue infections of the chest wall. *Ann Thorac Surg* 1997, 64:276-279.
13. Roje et al. Necrotizing fasciitis: literature review of contemporary strategies for diagnosing and management with three case reports: torso, abdominal wall, upper and lower limbs. *World Journal of Emergency Surgery* 2011, 6:46
14. G. Lorenzini et al. Cervical necrotizing fasciitis of odontogenic origin involving the temporal region-A case report. *Journal of Cranio-Maxillo-Facial Surgery* 39 (2011) 570-573.
15. Yadav, Verma, and Sachdeva. Facial necrotizing fasciitis from an odontogenic infection. *Oral Surg*

Oral Med Oral Pathol Oral Radiol 2012; 113:e1-e4.

16. Whitesides L, Cotto-Cumba C, Myers RAM. Cervical necrotizing fasciitis of odontogenic origin: A case report and review of 12 cases. *J Oral Maxillofac Surg* 2000; 58:144-151.
17. Cora DC, Tulsyan N, Cudjoe EA, Onime GD, Pyo DJ, Weinstein L. Necrotizing fasciitis of the head and neck: report of two cases and review. *Head and Neck* 2002; 497-501.
18. JM Shand, A Breidahl, NR Hing,BR Johnstone, D Wiesenfeld. Ascending necrotising fasciitis as a result of odontogenic infection: a report of two cases. *Australian Dental Journal* 2001; 46 :(2):134-138.
19. KC Toran, Nath, Shrestha, Rana BBS JB. Odontogenic origin of necrotizing fasciitis of head and neck - a case report. *Kathmandu University Medical Journal* (2004) Vol. 2, No. 4, Issue 8, 361-363.
20. Obiechina AE, Arotiba JT, Fasola AO. Necrotising fasciitis of odontogenic origin in Ibadan, Nigeria. *British J Oral Maxillofac Surg* 2001; 39:122-126.
21. Yiu WT, Shyun HJ, Hung CC, An CH. Cervical necrotizing fasciitis of odontogenic origin: Report of 11 cases. *J Oral Maxillofac Surg* 2000; 58:1347-1352.
22. Skitarelic´ N, Mladina R, Morovic´ R, Skitarelic´ N. Cervical necrotizing fasciitis: sources and outcomes. *Infection* 2003; 31: 39-44.
23. N. Jallali et al. Hyperbaric oxygen as adjuvant therapy in the management of necrotizing fasciitis. *The American Journal of Surgery* 189 (2005) 462–466.