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NECROTIZING FASCIITIS DUE TO *Finegoldia magna (Peptostreptococcus magnus*) AS THE SOLE ISOLATE- RARE REPORT FROM INDIA

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Abstract- We report a case of necrotizing fasciitis by *Finegoldia magna* (formerly *Peptostreptococcus magnus*) in a 70 year old male patient, which started after trauma with wooden stick. Immediate institution of treatment is necessary to stop progression of the disease and improve the prognosis of the case. In general, Gram positive anaerobic cocci (GPAC) are susceptible to the antibiotics used to treat an anaerobic infections. However microbiologists should realize that the *F. magna* has one of the highest resistance rates among GPAC and that there seems to be geographical differences in resistance. Microbiologist should pay more attention towards identification of *F. magna* from suspected clinical specimens.

Keywords- Necrotizing fasciitis, Gram positive anaerobic cocci (GPAC), anaerobic infections

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Introduction

Since the skin is the major interface between humans and their environment, it is not surprising that bacterial, fungal and viral infections of the skin and the underlying soft tissues are the most common human infections. Necrotizing fasciitis is an cute necrotizing cellulitis that involve the superficial and subcutaneous fat [1]. The outstanding characteristics of these infections are extensive undermining of surrounding tissue, which may result in patchy cutaneous anesthesia or gangrene. There are two main causes of necrotizing fasciitis: *Streptococcus pyogenes* and synergistic infection with facultative aerobic and anaerobic bacteria usually of bowel origin [2]. The correct diagnosis was made on surgical exploration. On incision, blunt dissection showed disintegration of the fascial plane with extensive undermining. At the time of incision, finding of the gram stain smears of the exudates guided antibiotic therapy. However antibiotic therapy by itself is not curative, surgical treatment is most important. Knowledge of recent environmental exposure may be critical to making correct etiological diagnosis. Culture is usually gold standard and productive [3,4].

We report a case of *Finegoldia magna (F. magna)* from necrotizing fasciitis in a 70 years old male patient after trauma by wooden stick.

Case Report

A 70 years old male patient presented to the surgery OPD with complaints of right leg swelling due to trauma by a wooden stick three days back when he was walking bare foot. Swelling was insidious in onset and was associated with pain and fever. Patient was a known asthmatic & had a history of Ganja smoking which he stopped 4 years back. He had no history of diabetes, hypertension and tuberculosis. On local examination the limb had evidence of cellulitis over (Rt.) foot and thigh. There were (3×4 cm) blisters over medial aspect of thigh with local rise of temperature, tenderness. [Fig-1].

On general examination, his pulse was 80/min regular and blood pressure was 120/80 mm of Hg. The systemic examination was within normal limits. The renal function tests were deranged (Blood urea -118 mg/dl & Serum creatinine -3.5mg/dl). The tridot for HIV and VDRL were nonreactive & HbsAg was negative. The patient was taken up for emergency debridement [Fig-2]. The pus was collected aseptically and sent to the microbiology laboratory for aerobic and anaerobic culture. Intravenous medication - Amoxycillin+clavulaenic acid, Gentamicin and Metronidazole were started. After 7 days of operation wound was healing [Fig-3].

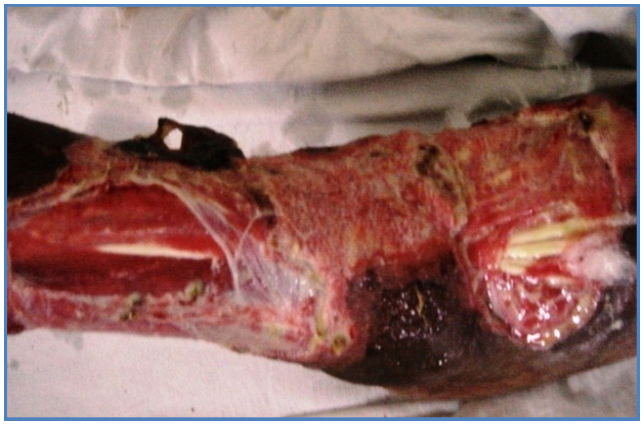

Fig. 1- Foot lesion

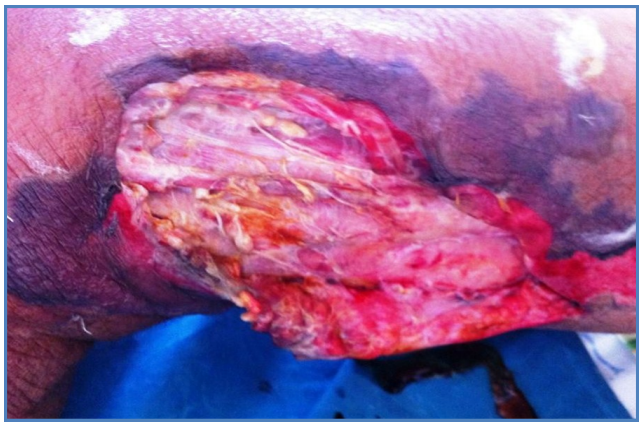

Fig. 2- Surgical debridement (thigh lesion)

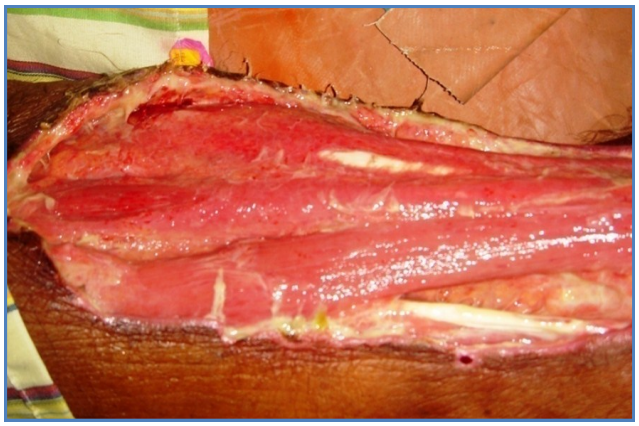

Fig. 3- Post operation day 7 (thigh lesion)

Gram stained smear of pus from debridement showed numerous polymorphonuclear leucocytes & gram positive (intracellular and extra cellular) cocci. Sample was inoculated on blood agar and Mac Conky's agar for aerobic culture at 37°C for 48 hours. Aanaerobic culture was put into Brucella blood agar & incubated anaerobically in Mc Intosh Field's anaerobic jar at 37°C for 48 hours. Aerobic culture revealed no growth after 48 hours of incubation. Anaerobic culture showed small, semi transparent, hemolytic colony on blood agar. Colonies were β-hemolytic and approximately 1mm in diameter, convex, whitish [Fig-4]. The Gram staining of the smears from the colonies revealed gram positive cocci in short chain, presumptively identified as Gram positive anaerobic cocci (GPAC)[Fig-5]. Organisms were catalase negative and a sub culture was made from the original plate and put on in another subculture plate for aerotolarence test. Aerotolerance test was negative after 24 hours.

Phonotypical techniques to identify GPAC were difficult as most of the organisms from this group did not show saccharolytic activity and only produced acetate as volatile fatty acid (VFA). Identification therefore based upon negative reactions and some current automated system i.e. Vitek 2 system version 0.5.02. Recently BioMerieux (Marcy, France) has developed a new card for identification of anaerobic bacteria. The isolated GPAC organism was subsequently confirmed by VITEK 2 system (BioMerieux) which identified this strain with a very good profile of acceptance (95%) as *F. magna* which is member of the normal human flora that colonizes intestine, female genital tract, skin and is usually susceptible to β- lactam antibiotic and vancomycin. The genus *Finegoldia* belongs to the class Clostridia, phylum Firmicutes. It was first described in 1993 by Prevot [5] and named as diplococcus magna based on the cellular appearance. In 1983 Ezaki et al [6] transferred this to the genus *Peptostreptococcus* based on DNA base composition, DNA-DNA hybridization and cellular fatty acid profiles. Classification by using pyrolysis mass spectrometry (PMS) *P. magnus* was showed diverse from other GPAC species [7] and 16S ribosomal sequence analysis indicated that *P. magnus* is phylogenitically distinct from the other GPAC and therefore, the genus *Finegoldia* was proposed to cover the species *F. magna* [8,9]. It is recently placed as a single species in this genus.

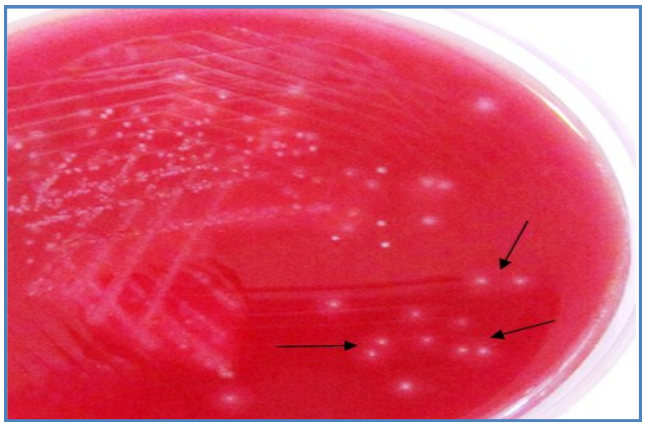

Fig.4- Growth on Brucella Blood Agar

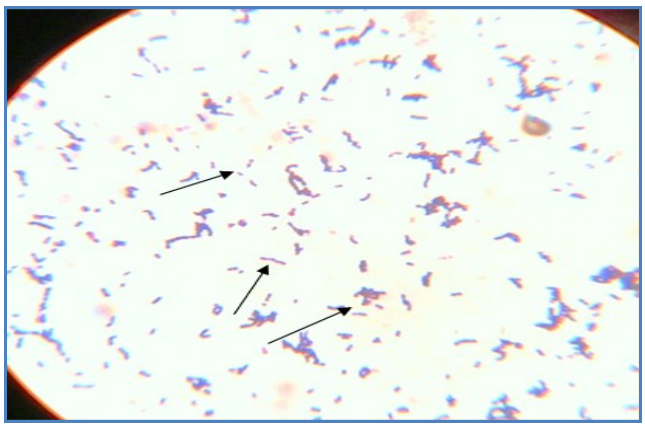

Fig. 5- Grams staining- clumps of bacterial cells mostly in tetrad formation and short chains of Gram positive cocci.

Discussion

This 70 years old male patient was diagnosed as a case of necrotizing fasciitis following trauma with a wooden stick. Causative agents of cellulitis are mainly polymicrobial in nature like *Group D Sreptococcus*, *Staphylococcus* and GPAC [ ]. It is interesting that in our case cellulitis started after minor trauma and the collagenase production as a virulence factor of *F. magna* was associated with the site of infection. Collagen is abundantly present in the skin, tendons, cartilage and is an organic component of bones, teeth and the cornea. The breakdown of collagen will result in loss of tissue integrity and disease progression, hereby providing an environment suitable for growth of anaerobic bacteria. The production of collagenase may be also important for the growth of asaccharolytic bacteria like *F. magna*, since during collagen breakdown amino acids are released which may be necessary for growth and survival. Two proteinase enhance the virulence factor of *F. magna*. They are subtilisin-like proteinase (Suf A) and *F. magna* adhesion factor (FAF).FAF express by 90% of *F. magna* strain [2,10].

F. magna was also reported from a case of mediastinitis following coronary artery bypass surgery in a 50 year old patient by Solen et al (2009) [11]. Pierre-Yves levy et al from France (2009)[12] reported 13 patients with prosthetic infection in joints due to *F. magna* from patient presented with either polymicrobial infection after open fracture or nosocomial infection after recent implantation. Sungsil Lee et al from Korea (2008) [13] reported a case of necrotizing fasciitis by polymicrobial flora involving *Streptococcus agalactiae, Arcanobacterium haemolyticum and F. magna.* It has been identified from diabetic foot infections and breast abscess. *F. magna* is also reported from a case of toxic shock syndrome due to super antigens.

Our case showed sole source of *F. magna* isolation and represented as sole source of infection. Several authors [14,15] have shown that *F. magna* has a negative influence on healing of chronic wounds but it is not clear whether these strains express only one virulence factor or several, and if there is a coherence between different virulence factors such as *SufA* and *FAF*, as has been described by Karlsson et al (2009). Brazier et al (2003) reported that amongst GPAC *F. magna* has highest rate of resistance [16].

This present report demonstrate that a simple minor trauma by wooden stick on leg can cause cellulitis to necrotizing fasciitis in a immunocompetant patient, depending upon the possession of virulence factors of the organism. To the best of our knowledge we are presenting first report of necrotizing fasciitis by only *F. magna* as single pathogen in our patient. Immediate institution of treatment is necessary to stop progression of the disease and good prognosis of the case. In general, GPAC are susceptible to the antibiotics used to treat an anaerobic infection. However microbiologist should realize that the *F. magna* has one of the highest resistance rates of GPAC and that there seems to be geographical differences in resistance.

Conclusion

Physician should suspect *F. magna* infections from cases of cellulitis and necrotizing fasciitis specially if aerobic cultures appears to be sterile. Microbiologist should pay more attention towards identification of *F. magna* from suspected clinical specimens. An automated identification system plays a vital role in diagnosis of severe infections. To get a coherent picture of *F. magna* and its pathogenecity, studies with larger groups of strains should be performed.

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