International Journal of Otorhinolaryngology and Head and Neck Surgery
Singh CV et al. Int J Otorhinolaryngol Head Neck Surg. 2018 Nov;4(6):1505-1507
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20184369

Case Report

Morganella morganii: associated sinusitis with orbital abscess in a diabetic patient

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Received: 20 July2018
Accepted: 27 August 2018

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ABSTRACT

Morganella morganii is a gram negative pathogen and may cause lethal disease in patients with immunosuppressive disease. It is commonly found in long term urinary catheter used and immune system deficiency patients as nosocomial disease. *Morganella morganii* was also involving skin, skeletal system and central nervous system. In this case we present sporadic *Morganella morganii* infection on sinonasal region with the presence of sinusitis, orbital absess, preseptal cellulitis and lamina propasia defect on 58 year old female diabetic patient. Microbiological assessment from nasal tissue and sinus puss discharge were reported as *Morganella morganii*. This is the first case of sinonasal *Morganella morganii* infection with sinonasal, preseptal cellulitis and orbital absess with lamina papyracea bone destruction.

Keywords: *Morganella morganii*, Pansinusitis, Preseptal cellulitis, Lamina papyracea bone destruction

INTRODUCTION

Morganella morganii is a member of *Proteae* which is included in *Enterobacteriaceae* family.[1] *M. morganii* is a Gram-negative *Proteae* family opportunistic bacillus which is usually found in the environment and in the intestinal tracts of humans, mammals, and reptiles as normal flora. They can cause wound infections, urinary infections in patient of urolithiasis, pneumonia, skeletal infections and central nervous system disease.[2-4] M. morganii can cause wound infection and urinary tract infection perinatal infections, late onset neonatal infections, fatal necrotizing fasciitis, skeletal infections and central nervous system infections.[3,5] Appropriate antibiotic therapy is important for the best treatment of the disease. Combination therapy with two antibiotics based on susceptibility of organism is preferred for complicated cases and immune compromised patients. Surgical therapy is indicated for treating underlying disease.

CASE REPORT

A fifty eight year old female diabetic patient came with complaints of fever and a history of yellowish discharge, eyelid swelling, ptosis, pain, redness, and reduced vision in the left eye in department of otorhinolaryngology. She presented with epiphora six days prior to her visit in opd. Her visual acuity was 20/20 in the right eye and 20/100 in the left, pupils were equal, with normal reflexes. Left eye presented with proptosis, chemosis, extraocular motility limitation, purulent drainage, swelling, loss of vision. The patient was admitted to the hospital and intravenously Piptaz was given 12 hourly. Leukocytosis and hyperglycemia were detected on laboratory investigation. Pus and granulation tissue was seen in middle and superior meatus on anterior rhinoscopy.

CT scan suggested mucosal thicknesses on B/L maxillary, ethmoid, sphenoid and frontal sinuses (Figure 1). 2.4×1 cm ill-defined hetrogeneously enhancing soft tissue lesion along the superior medial aspect of medial wall and roof of the left orbit extending into the left optic canal. Medially its abutting the left optic nerve with thickening of the nerve, perilesional fat noted in intraconal compartment. Furthermore erosive abscess formation with a size of 3×1.5 cm on periorbital area and inflammatory thickness on optic nerve and retro-orbital fat tissue were detected. There was no intracranial involvement. B/l mucosal thickening in frontal anterior ethmoidal and maxillary sinus left osteomeatal unit obliterated. Nasal septum deviated to left side.

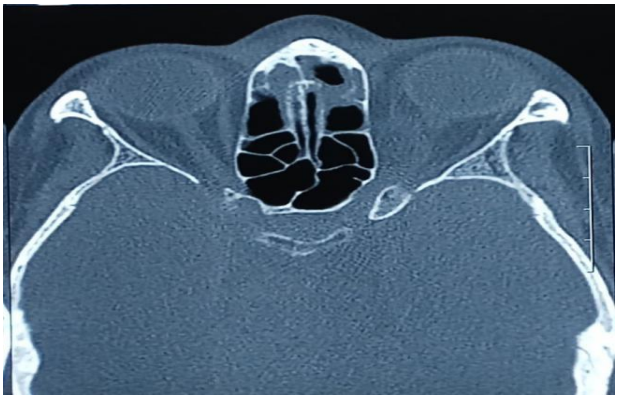

Figure 1: Preoperative computed tomography image.

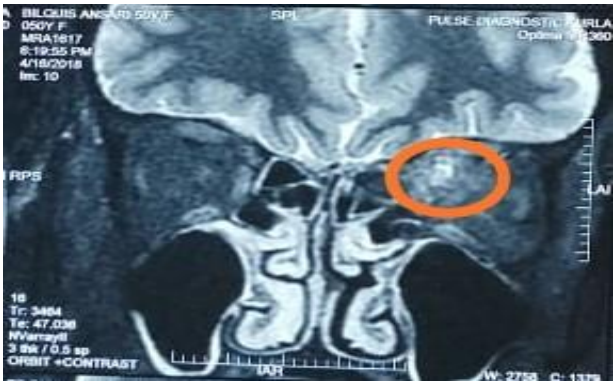

Figure 2: Preoperative magnetic resonance image.

MRI showed ill-defined inhomogenous inflamatory soft tissue and anterior superior aspect of left eye patchy marrow edema seen in lateral wall of left orbit without any obvious cortical breech. Diffuse hyperintense signal is noted in the left optic nerve in the intraorbital segment with marked posterior contrast enhancement. Intraorbital left optic nerve was bulky as compaired to opposite side.

Diagnostic nasal endoscopy showed, left middle concha necrotic and adhered to septum. Rest of nasal cavity was filled with pus, granulation and necrotic tissues. Left side lamina papyracea was eroded. Endoscopic sinus surgery was performed under general anesthesia. Frontal maxillary and ethmoidal sinuses were cleared by removing all granulations, necrotic tissues and pus and sent for microbiological and histopathological assessment. Irrigation of the nasal cavity including supra orbital cells, frontal, ethmoidal and maxillary sinus was done.

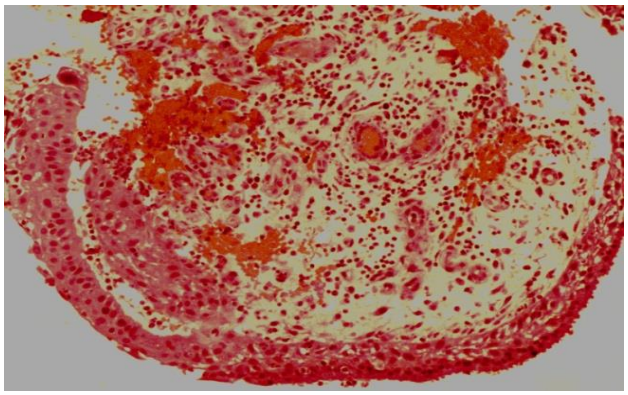

Figure 3: Tissue histopathalogy granuloma pyogenicum.

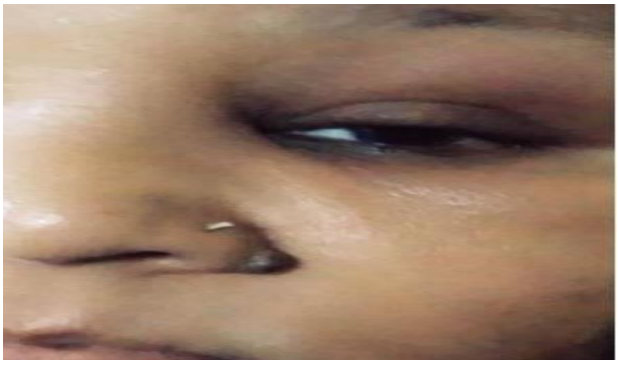

Figure 4: Postoperative left eye image of patient.

In microbiology laboratory, the granulation tissue specimen was inoculated onto 5% sheep blood agar and Eosin MacConkeys agar media plates. Then, these media plates were aerobically incubated at 35±2°C for 18-24 hours. Identification and susceptibility testing of Gram negative isolate was performed by using automated system (Vitek 2). Interpretation of antimicrobial susceptibilting was done as per Clinical Laboratory Standard Institute (CLSI 2018) guidelines Escherichia coli ATCC 25922 reference strain was used for the quality control of antimicrobial susceptibility testing. *M. morganii* was observed on cultures taken from granulation tissue and final pathologic diagnosis of nasal tissue from left ethamoid and middle meatus region granuloma pyogenicum.

Morganella morganii is intrinsically resistant to tetracyclines, nitrofurantoin, colistin, and polymyxin B.

Meticulous insulin therapy for regulation of diabetes and I.V. piptaz 4.5 gm 3×1 gr, amikacin 1×1 gr for 10 days, Tab flucon 150 mg was given. Preseptal cellulitis, sinusitis regressed and general condition of patient

improved. Patient was sent home on the third postoperative day, that time patient was afebrile, with a marked decrease in eyelid swelling and improved left ocular motility. However there was no improvement of vision.

DISCUSSION

Morganella is a motile, facultative anaerobic and non-encapsulated, and it hydrolyzes urea and reduces nitrates ferments glucose and mannose but not lactose. Gram-negative opportunistic bacillus which is a member of *Enterobacteriaceae* family.[1] Morgan described 1905 a non-lactose-fermenting organism as a different pathogen while studying the infantile diarrhea.[6] Winslow named Bacillus morganii for the production of indole and the fermentation of carbonhydrates and non-ability of liquefaction of gelatin.[7] Brenner et al and Farmer et al showed that *Morganella* is a different organism from Proteus.[8] Identification of *M. morganii* is made by recovery of small, oxidase negative, catalase and indole positive Gram negative rod on 5% sheep blood agar or EMB agar. *M. morganii* immunosuppressive treatment, poison contamination, history of surgery, advanced age, urolithiasis, improper antibiotic therapy and AIDS are the risk factors for *M. morganii* infections.[9] In this case, presence of DM and improper antibiotic therapy were the risk factors that we found for *M. morganii* infection. There were sinusitis and bone defects at medial, inferior part of maxilla and lamina papyracea. In the literature, no bone defect caused by *Morganella* infection was reported in sinonasal region.

Treatment should be done by medically and surgically if needed. Due to the opportunistic character of *M. morganii*, underlying disease must be treated. Uncomplicated and early diagnosed infections can be treated with mono antibiotic therapy. Choice of antibiotic treatment is very important because improper antibiotic therapy is a risk factor for development of *M. morganii* infection.[9] *M. morganii* is resistant to antibiotics by chromosomally encoded AmpC betalactamases and possesses the ability to develop resistance upon exposure to broad-spectrum cephalosporins.[10] Most strains are naturally susceptible to piperacillin, ticarcillin, mezlocillin, third and fourth generation cephalosporins, carbapenems, aztreonam, fluoroquinolones, aminoglycosides, and chloramphenicol. In case of abscess formation, cutaneous open wound or concurrent disease chronic pansinusitis, sinoorbital fistula and orbital abscess formation on periorbicular tissue surgery should be done.

CONCLUSION

M. morganii is a rare opportunistic pathogen which could cause serious diseases. This infection must be treated with multidisciplinary approach otherwise sinusitis, orbital cellulitis and abscess can rapidly progress to an intraconal abscess and can cause severe visual sequelae. Prompt recognition and appropriate surgical management of this condition are necessary to prevent vision loss.To our knowledge this is the first case in sinonasal region with uncommon features of this infection like lamina papracae bone destruction, pansinusitis preseptal cellulitis and orbital abscess.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Singh CV, Radia S, Nagaonkar S, Desai M, Shivaprakasha S, Gupta H. *Morganella morganii*: associated sinusitis with orbital abscess in a diabetic patient. Int J Otorhinolaryngol Head Neck Surg 2018;4:1505-7.