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Case Report

Nocardia asteroids: A case report of post-operative endophthalmitis

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Abstract: Post-operative *Nocardia* endophthalmitis has an aggressive course and poor visual outcome. The major clinical manifestations of N*ocardial* endophthalmitis are decreased visual acuity, which usually progressed over days, eye pain, foreign body sensation, necrotizing chrorioretinits, retinal detachment, anterior uveitis, and inflammation of vitreous, abcess in sub retinal space, vitreous and anterior chamber. Finding: A 50 years old lady presented with complaints of decreased vision in left eye since one month. She gave history of left eye cataract surgery one month back at another centre. She is a diabetic and hypertensive. On direct microscopy and culture of the AC wash *Nocardia* was isolated and identified. She was started on antibiotics based on antibiotics susceptibility. Vision improved over time. Conclusion: *Nocardia* endophthalmitis manifests late after cataract surgery in an aggressive form and carries a poor visual outcome. An early diagnosis and the use of correct antibiotic regimen may salvage the vision.
Keywords: *Nocardia* endophthalmitis, hypertensive

INTRODUCTION:

Nocardia infection of the ocular surface was first reported by Bruce and Locatcher-Kharazo in 1942, as a punctuate Keratoconjuntivitis that resolved following treatment with tropical and oral potassium iodide. Since then sporadic case reports of *Nocardial* infections of the eye and ocular adnexa manifested as dacrocystits, conjunctivitis, keratitis, episcleral granuloma, persistent epithelial defect, scleritis and endophthalmitis [1].

Acute endophthalmitis occurs 6weeks after surgery (more prominently cataract surgery). The organisms associated commonly include *Streptococcus pneumonia, Pseudomonas aeruginosa, and Staphylococcus aureus, Enterococci, E.coli and Klebsiella*. Fungi include *Aspergillus* spp mostly.

CASE REPORT:

A 50 years old lady presented with complaints of decreased vision in left eye since one month. This was painful and sudden. Associated with watering and redness. She gave history of left eye cataract surgery one month back at another centre. She is a diabetic, since ten years, taking insulin and oral hypoglycemics presently. She is also a hypertensive. On examination, the left eye showed diffused congestion of the conjunctiva (Fig 1). Exudates in anterior chamber. Pupil was irregular and mid dilated. Her vision was counting finger from 1meter. B scan showed clear vitreous with choridal thickening.

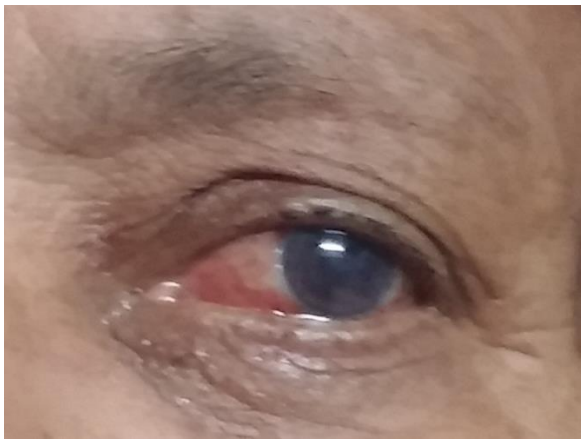

Fig 1: Patients eye showing signs.

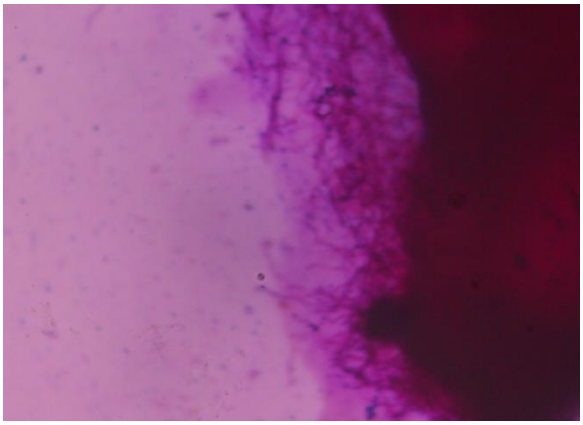

Fig 2: Direct smear with Grams stain with Gram positive filaments

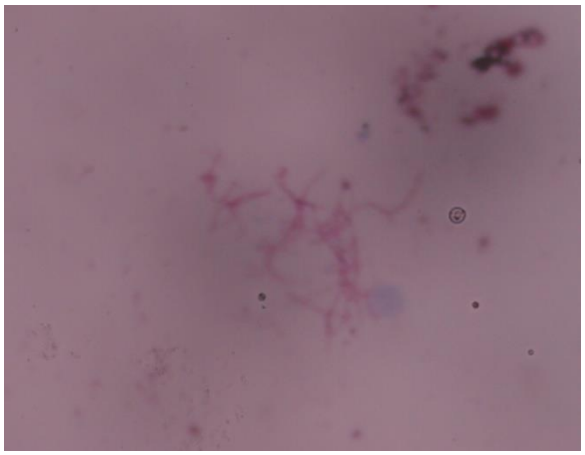

Fig 3: Modified AFB stain with Acid fast filaments

Fig 4: Blood agar with colonies

Fig 5: chocolate agar with colonies

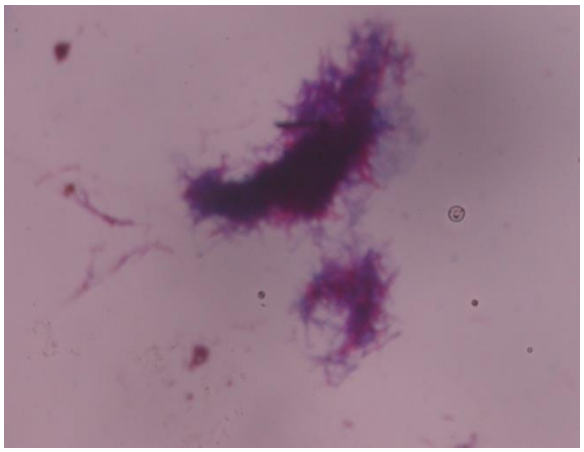

Fig 6: culture Grams stain with Gram positive filaments.

On admission her blood pressure was 130/70mm of Hg and RBS was 143mg/dl. She was posted for PPV+IOL explanations under local anesthesia. Anterior chamber wash was collected and sent to Microbiology laboratory. Intra vitreal amikacin (200µg/0.1ml) was given. Post operatively she was started on oral Bactrim DS and tropical Gentamycin and Gatifloxacin.

At laboratory, AC wash sample on gross examination was watery with one speck of material. The sample was centrifuged; form the deposit direct examination and cultures were done. Direct gram stain revealed plenty of polymorphonuclear leukocytes and Gram positive thin, filamentous branching beaded forms (Fig 2). Modified acid fast stain with 1% sulfuric acid showed thin acid fast branching filamentous forms (Fig 3). The direct microscopic examinations were suggestive of *Nocardia* morphology. The cultures put up were on BA, CA, SDA, and BHI.

BA - after 48 hrs of incubation at 37 ^{0}C showed dry wrinkled granular white colored colonies (Fig 4).

CA – showed white colored colonies (Fig 5).

Gram stain from the colonies revealed thin Gram positive branching filamentous forms. Modified AFB stain also revealed the presence of thin branching filamentous AFB (Fig 6). Biochemicals were put up. Urea was hydrolyzed, citrate not utilized, Gelatin was not liquefied. Glucose and arabinose were fermented lactose and xyloses were not fermented. The organism was identified as *Nocardia asteroides*. AST was put up on MHA which was sensitive to ciprofloxacin, Ofloxacin, Gatifloxacin, Amikacin, Gentamycin and Clotrimaxazole and resistant to Ceftazedime and Vancomycin. The treatment was continued for 6 weeks and after follow up of 3months, the condition of the eye was stable.

DISCUSSION:

Cataract surgery is the most common ocular surgical procedure performed and majority of the cases of post OP endophthalmitis follows cataract surgery. Endophthalmitis is rare but devastating infection, caused by diverse organisms but predominantly by bacteria. In recent years, there has been an improvement in prognosis of post surgical endogenous due to better understanding of aetio pathogenesis, improvement in diagnostic techniques like PCR, availability of broad spectrum antibiotics and finer vitrectomy instruments [2].

Nocardia spp belong to the obligate aerobic *actinomycetes* group –Phylum *Actinobacteria*, order: *Actinomycetales* of bacteria which are Gram positive bacilli showing branching filamentous forms are non spore forming and acid fast bacteria. These bacteria are saprophytic and are found in soil and water [3]. Among more than 85 identified species of *Nocardia*, approximately 25 spp are associated with human infections and include *Nocardia asteroides complex, N,brasiliensis, N, abscessus, N. cyriacigeogica, N.farcinica, N.nova, N.transvalensis complex, N.nova complex, N.pseudobrasiliensis and recently reported N.veteran and N. cerradoensis* [4].

Transmission is thought to be through contaminated soil. Human to human transmission is not documented. It is not transmitted from animals. Clinical manifestation of *Nocarida* may be cutaneous infections – contamination, Systemic nocardiosis – Pulmonary inhalation, Metastatic manifestations – dissemination, Kidney, brain, joints, heart, eyes and bones. *Nocardia* endophthalmitis is a rare but serous intraocular infection. This can be endogenous hematogenous dissemination or exogenous post op or trauma in origin [5]. The present case report is exogenous in origin after cataract surgery.

The major clinical manifestations of N*ocardial* endophthalmitis are decreased visual acuity, which usually progressed over days, eye pain, foreign body sensation, necrotizing chrorioretinits, Retinal detachment, anterior uveitis, inflammation of vitreous, abcess in sub retinal space, vitreous and anterior chamber [6].

In the present case she presented with decreased vision pain and FB sensation. Identification includes microscopy and culture. This is made more rapid, precise and accurate with PCR and Ibs rDNA sequencing than the conventional phenotypic methods. Other modalities are histology and radiology in correlation with clinical presentation.

The conventional methods:

A – Microscopy – Gram stain gram positive bacilli – thin branching beaded filaments.

– Modified acid fast stain with 1% sulfuric acid shoes thin acid fast branching filamentous forms.

B – Culture on blood agar, SDA medium is enriched with yeast extract may improve the chances of isolation. Colonies of Nocardia spp usually appear after 48hrs of incubation and a visible growth may take more than a week for some spp, Laboratories may fail to isolate *Nocardia* from clinical specimens if plates are discarded after 48hrs [4].

Nocarida in eye was initially reported in 1942 by Bruce and Locatcherkhosazo as punctuate keratoconjuctivitis. Benedict and Iverson in 1944 reported based on positive culture and smear. Davidson and Forester in 1967 reported endogenous endophthalmitis based on positive histology. Burpee and Starke in 1971 reported exogenous endophthalmitis based on positive culture and smear [7]. Gupta *et al.;* in 1982 reported bilateral conjunctivitis, culture growed *Nocardia* and pt was cured with treatment [8]. Mark *et al.;* in 1990 reported *N.asteroides* endophthalmitis in a male heart transplant recipient by retinal biopsy, smear and culture and he removed after completion of treatment [6]. Venkatesh *et al.;* in 1998 reported *Nocardia* keratitis in a male pt with trauma eye which responded to 0.12% polyhexamethylene biguanide [9].

Rao et al in 2000 reported *Nocardia asteroides* keratitis in 7 patients which were culture proven [1]. Bharati *et al.;* in 2004 reported *Nocardia asteroides* Cananculitis in a lady was culture proven and recovered by treatment [10]. Eugene *et al.;* in 2005 reported *Nocardia* endophthalmitis and sub retinal abcess in women which was compared histology, culture and imaging [3]. Nikhil *et al.;* in 2007 reported *Nocardia asteroides* in a male and female patient was culture proven [11].

Lisa *et al.;* in 2012 reported endogenous *Nocardia farcinia* in a female immunosuppression patient, it was proven by culture and imaging. Pradhan *et al.;* in 2012 reported *Nocardi asteroides*

endophthalmitis in a female which was culture proven and resolved within treatment [12]. Haripriya *et al.;* in 2012 reported endophthalmitis associated with limbal relaxing incision in an old man and he improved on treatment [13]. Prabhu Shanker *et al.;* in 2013 reported 8 cases of Nocardia endopthalmitis over 2 ½ year [2]. Savitri Sharma *et al.;* in 2014 studied endopthalmitis patient over a period of 3 years reported bacterial and fungal isolates; no case of *Nocardia* was isolated in this study [14]. Navarrete *et al.;* in 2015 reported endophthalmitis in a disseminated Nocardiasis [15]. Rafael *et al.;* in 2015 reported traumatic endophthalmitis by *N.kruczakiae* in a boy. Pt improved over treatment [16]. One Indian study has reported unusually high (60%) *Nocardia* infection in post OP endophthalmitis [14].

The outcome of *Nocardial* endophthalmitis can be poor due to its delayed presentation and extensive involvement of the anterior chamber, poor antibiotic penetration, and antibiotic resistance [12]. The main stay of treatment of *Nocardia* endophthalmitis is appropriate antibiotics. In addition to antibiotic treatment, some authors recommended early surgical intervention as they believe that inadequate response to media is due to poor antibiotic penetration.

CONCLUSION:

Early diagnosis can help to effectively manage Nocardia ocular infections, but requires a high index of clinical suspicion and microbiology laboratory support.

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