

Mycobacterium fortuitum Infections in Surgical Wounds

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MJAFI 2009; 65 : 91-92

Key Words : *Mycobacterium fortuitum*; Surgical wounds

Introduction

Non-tuberculous mycobacteria (NTM), which include *Mycobacterium fortuitum* and *M. chelonae* are rapidly growing mycobacteria, widely distributed in nature having been isolated from natural water, tap water, soil and water used in showers and surgical solutions [1]. They have been the cause of a variety of clinical presentations in cutaneous disease but rarely cause disseminated infections [2]. The source of infection is frequently contamination of the wound, directly or indirectly with contaminated tap water. The most frequently reported infections are post surgical, primary cutaneous and pulmonary [3]. Studies in India have isolated NTM from various sites and procedures viz. skin and soft tissue infections after laparoscopic procedures [4,5]. We report a series of five cases of post surgical wound infections in immunocompetent individuals over a period of six months, who presented with delayed wound healing, discomfort over site of incision and chronic serous discharge. The detection and identification of the causative agent may be missed unless a direct Ziehl Neelsen (ZN) stain for acid fast bacilli and culture on Lowenstein Jensen (LJ) media is done from all chronic post surgical wound infections, since routine aerobic cultures are sterile and antibiotics for pyogenic infections do not work satisfactorily.

Case Series

Three female and two male patients between the ages of 30-40 years, who underwent laparoscopic tubectomies and routine herniorrhaphy respectively, presented with a nodular swelling, at the site of incision within a month of their surgical procedures, which progressed to chronic discharging sinus from a small opening. Post operatively all the patients had apparently healthy wounds and stitches were removed between 7-10 days after surgery. Three cases presented with nodular swellings which progressed to chronic discharging sinus from a small site over the site of incision. The discharge from sinus at the healthy wound site increased on applying

local pressure and also by raising intra abdominal pressure. In two of the female patients the wound discharge was from the umbilical site of incision. All the patients were afebrile and manifested with local mild pain and discomfort, without any constitutional symptoms. On clinical examination there was mild tenderness and induration along site of incision. Systemic examination was normal with no lymph node involvement or hepatosplenomegaly. Chest and spine radiographs were within normal limits. Mantoux test was negative in all the cases.

Wound discharge was collected directly by sterile platinum loop in a syringe for further evaluation. Gram, Ziehl Neelsen (ZN) and lactophenol cotton blue stains were done for bacteria, mycobacteria and fungi respectively. Portions of the discharge/pus were put up for culture on to blood agar, Mac Conkey agar, Sabourads agar and Lowenstein-Jensen (LJ) media for aerobic bacteria, fungi and mycobacteria respectively. Culture was also put up on Robertsons cooked meat medium to exclude anaerobes.

Gram stain showed numerous pus cells and no organisms. ZN stain in all the cases showed acid fast bacilli. *M. fortuitum* was isolated in all five cases. Magenta coloured colonies were seen on Mac Conkey agar after 24-48 hours, whereas small non-pigmented white colonies grew on LJ media 2-3 days after inoculation. Additional tests as shown in Table 1 were done to confirm the identity of the organism as *M. fortuitum*. Antibiotic sensitivity testing was done by Kirby Bauer method for amikacin, cefoxitin, ciprofloxacin, clarithromycin. Positive tests that differentiated *M. fortuitum* from *M. chelonae* were nitrate reduction, assimilation of iron from ferric ammonium citrate and susceptibility to ciprofloxacin but resistance to polymixin B.

All the patients were started on combination course of amikacin and ciprofloxacin or clarithromycin, imipenem and amikacin for six weeks. In one case of tubectomy, a re-exploration was done to evacuate >500ml of purulent discharge from the abdominal cavity. Subsequently the exudative discharge turned into a sero sanguineous form before complete healing in two weeks. In the case of herniorrhaphy, the wire mesh had to be removed to permit wound

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Table 1
Identification of Atypical Mycobacteria

Test	Result
Rate of growth	2 days
Growth at 25°C	+
Growth at 37°C	+
Growth at 45°C	+
Aryl sulfatase test 3 days	+
Pigmentation	No pigmentation
Nitrate reduction	+
Growth on Mac Conkey	+
Tolerance to 5% NaCl	+
Citrate utilization	+
Identification	Rapidly growing mycobacteria <i>Mycobacterium fortuitum</i>

healing after four weeks of persistent discomfort and discharge from site of surgery.

Discussion

Distribution of NTM and incidence of disease caused by them is not fully understood [6]. Recently *M fortuitum* and *M chelonae* have been reported as a cause of abscesses and post surgical wound infections [7]. They are in all likelihood transmitted by aerosol, dust or contaminated tap water. In our study the post operative wounds in all the cases had initially healed satisfactorily after surgery. Only after a period of 12-28 days they became erythematous and started discharging pus in small quantity which later turned copious and serous in character. These wounds did not respond to antibiotics and persisted for long time before they were referred by the clinician for reevaluation. Typically wound infections due to NTM do not occur as an immediate post operative complication but take sometime to make their clinical appearance, when the operation scar breaks down and a non-healing superficial ulcer develops with discharging sinus [7,8]. Sethi et al reported seven patients with *M fortuitum* infections post laproscopic tubectomies [5]. Development of mild discomfort, induration, with/without local pain, swelling and serosanguineous discharge from a minute opening over the operated scar for past 2-3 weeks, heralds the onset of the infection. Aspirate specimens in such cases show no organism on Gram stain and cultures are sterile for aerobic and anaerobic organisms. Hence, all such sterile specimens must be stained by ZN method for acid fast bacilli (AFB) and subjected to culture on LJ media [9].

Surgical site infections due to *M fortuitum* are well documented, especially in association with cardio thoracic surgery [10]. Delayed wound healing, chronicity of infection with prolonged course of expensive antibiotics makes it a serious nosocomial infection. The

source is frequently contamination of the wound, directly or indirectly, with colonized tap water. Surveillance environmental culture from tap water, basin and operation theatre (OT) may not yield growth of NTM. Other nosocomial infections with this organism include infections of implanted devices (eg, catheters) and injection-site abscesses. Strict sterilization of all OT equipment and proper hand washing must be under taken to prevent wound infections.

Even though first line antitubercular drugs like ethambutol and rifampicin have a cidal effect against the organism, they are not used commonly. The preferred choice are a varying combination of antibacterial agents like amikacin, fluorinated quinolones, doxycycline, imipenem and clarithromycin [10]. In India few cases of *M fortuitum* infections are being underreported due to low suspicion of its presence amongst clinicians and microbiologists [4,7]. High degree of suspicion is needed for specific identification of the pathogen, specially in cases of chronic post operative wounds.

Conflicts of Interest

None identified

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