INVESTIGATION OF A CASE OF CLOSTRIDIAL MYONECROSIS

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KEYWORDS :

Introduction

Clostridial myonecrosis (gas gangrene) occurs in a setting of common muscle injury and contamination with soil or other foreign material containing the spores of *C perfringens* or other histotoxic clostridia; (a) penetrating war wounds (b) accidental traumatic civilian injuries (c) surgical wounds particularly after bowel or biliary tract surgery. Rarely, cases of gas gangrene have been reported following parental injections and at sites of venepuncture in granulopenic patients [1]. Clostridia commonly associated with gas gangrene are *C perfringens* (80%), *C novyi* (40%), *C septicum* (20%) followed occasionally by *C histolyticum*, *C sordelli*, *C fallax*, *C bifermentans* and *C sporogenes*. Gas gangrene may occasionally develop in the absence of an obvious external wound. This form of gas gangrene is designated as spontaneous nontraumatic gas gangrene and is caused by *C septicum*.

Since clostridia are distributed widely in nature, they can be cultured from multiple environmental sites in a hospital including air and dust even in the operation theatre. It is difficult to know from where the infective strain originated [2,3]. It is believed that most infections involving surgery are associated with endogenous strains, although outbreaks within hospital have been recognised. The elaborate system of handling environment in the operation theater (OT) and modern aseptic measures intraoperatively and postoperatively have reduced the incidence of post operative clostridial myonecrosis. Still sporadic cases do occur whenever there is breach in the OT environment management. We report here a case of post-operative clostridial wound infection and myonecrosis with the aim of bringing awareness of such possibilities.

Case Report

A 24-year-old male was admitted to a hospital with history of pain abdomen (left flank), burning micturition and haematuria of 3 months duration and was diagnosed as a case of renal calculus left. He was operated upon for pyelolithotomy. Post-operatively, he was given injection gentamicin alongwith other supportive measures. On the second post-operative day, patient developed features of toxemia - fever and tachycardia. There was seropurulent discharge from the surgical wound and the soft tissue around was crepitant. Radiograph revealed gas shadow in the muscular plane. The primary sutures were removed and wound debridement was done. Necrosed muscular tissue was sent for bacteriological investigations. The patient was treated with inj metronidazole, penicillin and cefotaxime. In about 10 days time the patient recovered from toxemia and became afebrile. Secondary suturing was done on 25th post-operative day and the wound healed uneventfully.

Specimens (purulent aspirates and necrosed muscle tissue) revealed presence of gram positive bacilli on direct microscopic examination. The samples were cultured both aerobically and anaerobically. Gram positive bacilli were grown anaerobically.

The organism was identified as *C perfringens* by cultural characters and biochemical reactions [4].

The OT was closed pending microbiological investigations and suitable disinfection following the suspicion of infection with *C perfringens*. Microbiological studies were conducted to find out the source of infection. It was noticed that the periodic blockage of the sewerage pipe and overflow of the effluents through the manhole outside the main entrance of the OT caused contamination of the kuchha area around OT with nightsoil. Investigation also revealed that simultaneously in the adjacent OT, a case of haemorrhoidectomy was performed and the movement of the staff from one OT to another was noticed. With this history, investigations were conducted to trace the source of infection.

The following samples were taken for the purpose.

Sample No.1 : Stool sample of the patient - to rule out possible endogenous source of infection.

Sample No.2 : Stool sample of the haemorrhoidectomy case - to rule out the possibility of transmission of infection from this case.

Sample No.3 : Swabs were taken by using moistened swab sticks from the following sites and were inoculated in Robertson's

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cooked meat media.

(a) From the OT table on which the haemorrhoidectomy case was operated.

(b) Floor of the same OT near the table.

(c) OT table where the index case was operated.

(d) Floor of the same OT near the table.

(e) Antiseptic solution used in that OT.

(f) Soil sample near the entrance of the OT.

(g) Soil sample near the side of the OT.

Samples 1 & 2 were subjected to both aerobic and anaerobic cultures. The cooked meat media inoculated with the swabs from different sites in the OT were incubated overnight at 37° C and then examined by Gram stain. Subcultures were done on blood agar and egg yolk agar from the cooked meat media and incubated anaerobically. Parallel aerobic subcultures were also done. Gram positive organism isolated anaerobically was identified by standard techniques including aerotolerance, Nagler's reaction, gelatin liquefaction, indole and urease production and nitrate reduction as *C. perfringens* [4].

C. perfringens was isolated from sample No. 3 c (swab from OT table where the index case was operated) and sample No. 3 f (soil sample from near the OT entrance). Both strains were morphologically and biochemically identical to the clinical isolate from the patient. Other samples from the OT environment and the stool samples did not grow *C. perfringens*.

Discussion

Clostridial myonecrosis (gas gangrene) usually complicates wounds associated with trauma and surgery. Historically clostridial myonecrosis has been tied intimately with the battle field [5]. Because of improved treatment in combat zone there has been a gratifying reduction in the incidence of gas gangrene: 5 per cent in World war I, 0.7 in World war II, 0.2 per cent in Korean war and 0.02 per cent in Vietnam war [6-8]. In peace time practice, traumatic injuries account for half of the cases of clostridial myonecrosis, the remainder being divided between post-operative complications (30%) and spontaneous gas gangrene (20%) [9-12]. Among the trauma cases, major trauma usually are because of motor vehicle, industrial and agricultural accidents, crush injuries, gunshot wounds and burns. In the surgical settings, the most frequent antecedent procedures are intestinal surgeries especially colon resection, appendectomy, surgical procedures on small intestine, upper GIT and biliary tract [13].

In the index case, *C. perfringens* infection is not due to endogenous contamination of wound as most of the surgical infections are associated with. Reasons being, the surgical site was retroperitoneal not involv-

ing intestine and also he was not a carrier of *C. perfringens* as evident by negative stool culture. This was, thus a case of exogenous infection. The source of infection was most probably the soil outside the OT as evident by isolation of similar organism from the OT table and from the soil outside. The modes of spread are either by dispersal of spores by air or by carriage of dust particles containing spores by footwears.

As the investigations were in progress the OT complex was decontaminated by fumigation and disinfectant wash. Subsequent samples were negative for *C. perfringens*. The operation theatre was put into function following satisfactory report. It was recommended that the engineering defects outside the OT be rectified. The active participation of the public health engineer in the prevention of the hospital infections is essential.

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