

AEROMONAS HYDROPHILA HAND INFECTION COMPLICATING AN OPEN ROLANDO FRACTURE: A CASE REPORT

SIDHA SAMBANDAN

SUMMARY

A case of Aeromonas hydrophila infection complicating an open Rolando's fracture of the hand is reported. Only two cases, both complicating open tibial fractures have been reported in the literature previously.^{1,2} The organism was resistant to the usual antimicrobial (ampicillin and cloxacillin) used in the management of open fractures at University Hospital, Kuala Lumpur. The severity of the infection is largely dependent on the resistance of the host, and could vary from a locally spreading necrotizing cellulitis without systemic signs to a frank septicaemia with serious consequences. Early diagnosis with adequate debridement of the wound and appropriate antimicrobial to which the organisms are sensitive, are essential for effective control.

CASE REPORT

M.B.S., a 46-year-old Malay labourer was admitted to University Hospital on 27 February 1984 following an industrial hand injury. Whilst working in a tin dredge, a steel bucket containing wet soil fell on his right hand. He sustained a crush

injury with deep laceration of the thenar aspect of the right hand with an open Rolando fracture (comminuted fracture of the base of the thumb metacarpal). There were no other associated injuries. Primary cleaning and sterile dressing was done immediately with intravenous administration of ampicillin 500 mg and cloxacillin 500 mg, six hourly.

Ten hours after the injury under general anaesthetic, proper debridement and irrigation of the wound was done. The thenar muscles including the adductor pollicis and first dorsal interosseous muscle were contused. The flexor pollicis longus (FPL) was partially cut on the volar aspect, and a comminuted fracture of the base of the thumb metacarpal was noted. After thorough wound toilet, the FPL was repaired and the fracture was stabilised with two Kirchner wires. The skin was closed without tension using 4/0 polyamide; and the hand immobilised in the functional position with a plaster back slab; and the limb elevated with continuation of antimicrobial therapy.

On the first post-operative day, the patient was febrile with a temperature of 37.5°C which subsided by the third day. But on the third day, the patient developed pain locally and on wound inspection was found to have a minimal serous discharge from one end of the wound. A swab was taken for culture and the wound cleaned and dressed. On the fifth day, though the patient was afebrile, the pain persisted and the discharge increased. There was local swelling too and hence all the sutures were removed,

Sidha Sambandan, MBBS, LRCP, FRCS (Eng)
Lecturer

Department of Orthopaedic Surgery
Faculty of Medicine
University of Malaya
Kuala Lumpur, Malaysia

and the wound cleaned with eusol and dressed. The swab grew a heavy growth of *Aeromonas hydrophila* but the antimicrobials were not changed, because of doubt of its pathogenicity. The organism had *in vitro* sensitivity to tetracycline, kanamycin, co-trimoxazole, and chloramphenicol but resistant to penicillin, ampicillin, and cloxacillin, direct smear of wound pus showed gram-negative bacilli.

On the eighth day, the patient was afebrile, but locally there was progressive sloughing with swelling. Desloughing with eusol dressing were continued. On the thirteenth day, the infection was found to be spreading with necrotizing cellulitis of the first dorsal web space too. This required an extensive debridement under a general anaesthetic, with removal of the devitalised thenar muscles. Tissue was sent for further cultures and the patient started on tetracycline 250 mg six hourly. By the fifteenth day, the infection had stopped spreading – and the cultures of the thirteenth day grew a moderate growth of *Aeromonas hydrophila*, with the same *in vitro* sensitivity as before. Swab cultures taken five days after the tetracycline treatment did not grow any organisms. Tetracycline was continued for two weeks.

The serum taken about four weeks after the injury showed an agglutination titre of 1/16 against heated (100°C – 10 minutes) saline suspension of the same strain of *Aeromonas hydrophila* in saline. Control sera from normal person showed no agglutination even when undiluted. The agglutination test was negative when the patient's serum was tested eight months after healing of the wound. The Kirchner wire was removed at six weeks. Though the patient has resumed his occupation and denies any disability at work, he has an adduction contracture of the thumb and is awaiting surgery for release of the contracture and opponens plasty.

DISCUSSION

Aeromonas hydrophila is a common inhabitant of the soil, in manure and water. It is a gram-negative bacillus, whose pathogenic potential was realised only recently. It has been frequently incriminated

as a cause of human gastroenteritis. Wound infection by *Aeromonas hydrophila*, especially those complicating compound fractures, however are very rare. It is usually of low virulence but occasionally causes serious progressive necrotizing infection with or without systemic signs. Blatz,¹ and Simodynes and Cochran² documented *Aeromonas hydrophila* infections complicating open tibial fractures. *Aeromonas hydrophila* in mixed culture with other pathogens occurs more commonly. Graevenitz and Mensch³ found only a third of the 30 *Aeromonas hydrophila* isolated to be in pure culture. *Aeromonas hydrophila* has been incriminated as a cause of liver abscess, meningitis, conjunctivitis, corneal ulcer, endocarditis, pneumonia, septic arthritis, osteomyelitis, gas gangrene and wound infections. The majority of the serious infections with septicaemia occurred in immuno-compromised individuals, exemplifying Louis Pasteur's statement: "It is not the germ but the terrain in which it grows that is important".

The contamination of the wound with wet soil; the gram-negative bacilli in the pus on direct smear; the isolation of a pure culture of *Aeromonas hydrophila*; the negativity of this culture after treatment with tetracycline, to which the strain showed *in vitro* sensitivity, and the positive although low agglutination titre in the patient's serum are evidence in favour of the pathogenic role of the strain in this patient.

Aeromonas hydrophila is resistant to the usual antimicrobials used in this institution and many others, for compound fractures, viz: ampicillin and cloxacillin. It is known to be resistant to most of the early generations of cephalosporins too. The lack of awareness of its pathogenicity, and its resistance to the conventional antimicrobials used in the management of compound fractures leads to a delay in diagnosis and treatment with potentially serious consequences. Early and adequate wound debridement together with appropriate antimicrobials can control the infection.

ACKNOWLEDGEMENTS

I wish to thank the Head of the Orthopaedic

Department and the Director of the University Hospital for kind permission to publish this paper; Professor Arasakularatna, Department of Bacteriology for the assistance given in the relevant bacteriological investigations; Ms Sharmini Devi for typing this manuscript.

REFERENCES

- ¹ Blatz D J. Open fracture of the tibia and fibula complicated by infection with *Aeromonas hydrophila*. *J Bone Joint Surg* 1979; 61-A (No 5): 790-791.
- ² Simodynes E E, Cochran R M. *Aeromonas hydrophila* infection complicating an open tibial fracture. *Clin Orth Rel Re* 1982; 171: 117-120.
- ³ Von Graevenitz A, Mensch A H. The genus *Aeromonas* in human bacteriology. Report of thirty cases and review of the literature. *New Eng J Med* 1968; 278: 245-249.