

Hemophilus Influenza Infection of an Implantable Insulin-Pump Pocket

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OBJECTIVE— To increase awareness of adverse events associated with the use of implantable insulin pumps.

RESEARCH DESIGN AND METHODS— A descriptive case report of a pump implant infection.

RESULTS— This is a case report of one implanted insulin pump-pocket infection among a series of 15 patients. After exposure to a child with a respiratory infection on PID 30, V.L.C. (the patient) developed a fulminant pump-pocket infection. *H. influenzae* was recovered from it. Despite aggressive antibiotic therapy, the infection could not be controlled. Insulin delivery ceased, and the pump was explanted. The pump-pocket infection rapidly resolved with pump removal, permitting later reimplantation.

CONCLUSIONS— We have adopted the American Heart Association indications and antimicrobial prophylaxis regimens recommended for prevention of endocarditis in patients with prosthetic valves for patients with implanted insulin pumps.

Infection is a serious complication of implantation of prosthetic joints, cardiac pacemakers, and, more recently, insulin pumps. The reported incidence of this complication is variable and usually is related temporally to implantation of the device or to postoperative access to it. Resident skin flora have been the predominant infecting organisms (1–3). To our knowledge, infection of an insulin pump pocket by *Hemophilus influenzae* has not been reported previously.

RESEARCH DESIGN AND

METHODS— V.L.C., a 34-yr-old woman, had IDDM of 5-yr duration, free of obvious late complications of diabetes. Implantation of the insulin pump in a subcutaneous pocket in the anterior abdominal wall and placement of the delivery catheter in the peritoneal space was unremarkable.

On PID 7, V.L.C. reported signs and symptoms of an upper respiratory infection and was treated with oral eryth-

romycin; recovery appeared complete. On PID 30, V.L.C. had contact with a 3-yr-old child who had symptoms of a respiratory infection. On PID 32, V.L.C. experienced abrupt onset of general malaise and oral temperature of 40°C. On PID 33, erythema of the skin overlying the pump exhibited, and edema was present at the pump site. Cefaclor was begun orally. On PID 34, increased redness, swelling, and tenderness overlying the pump were observed, and V.L.C. was hospitalized.

The pump pocket was aspirated and 250 ml of tan-colored purulent fluid was withdrawn. Gram stain revealed many leukocytes without visible organisms, but the culture grew B-lactamase positive *Hemophilus influenzae*. I.v. ticarcillin-clavulanate started on admission was discontinued, and 2 g i.v. ceftriaxone daily was begun. On 3 consecutive days, 1 g aztreonam in 50 ml of 0.45% normal saline was instilled in the pump pocket. All samples of pump-pocket aspirate subsequent to the first one and all blood cultures failed to grow organisms.

On PID 36, the implanted insulin pump failed to deliver insulin. Within hours, hyperglycemia rapidly progressed to early ketoacidosis. After blood glucose control was achieved with i.v. insulin, the insulin needs were met via conventional doses of subcutaneous human NPH and regular insulin.

V.L.C. was discharged from the hospital on PID 45 on a daily antibiotic regimen of ampicillin sulbactam 3.0 g every 8 h i.v. and 600 mg rifampin orally. Erythema and edema over the pump persisted; and on PID 54, the decision was made to explant the pump.

After explantation, the catheter hub was found to be occluded with aggregated insulin. Examination of the abdomen 9 days later revealed that all signs of infection had subsided. Oral augmentin continued until PID 72. On PID 182, a new insulin pump (MiniMed Model 2001, Sylmar, CA) was implanted un-

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PID, POSTIMPLANTATION DAY; IDDM, INSULIN-DEPENDENT DIABETES MELLITUS.

eventfully in the contralateral lower abdominal quadrant.

RESULTS — The temporal sequence of events and the recovery of *H. influenza* strongly suggest a hematogenous route of infection of the insulin pump pocket. Why this event resulted in catheter occlusion by denatured insulin is a matter of conjecture. It is unknown whether the *H. influenza* produced a factor that gained access to the catheter lumen and interacted with the insulin.

Little information is available concerning optimal therapy for this problem. We elected to treat aggressively with the pump in situ based upon the importance of the pump and the presence of *Hemophilus*, an uncommon organism to cause prosthetic infections (4), and one that was sensitive to antibiotics. This approach failed but the infection resolved rapidly once the pump was removed.

CONCLUSIONS — Hematogenous seeding of microorganisms into insulin-pump pockets can occur. When frank infection ensues, the cure may require pump explantation. We recommend antibiotic prophylaxis during respiratory infections and invasive procedures, following the American Heart Association guidelines for patients with prosthetic heart valves (5,6).

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