Migration Of The Distal Catheter Of A Ventriculoperitoneal Shunt Into The Abdominal Wall

Case Report

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Abstract : A case of migration of a Pudenz type peritoneal shunt catheter into the abdominal wall diagnosed with computed tomography is presented. This is a rare complication of ventriculoperitoneal shunt. It seems that a foreign body in the abdominal cavity and infection are the most important causal factors.

Key words : Abdominal wall, infection, ventriculoperitoneal shunt complication.

Many complications secondary to ventriculoperitoneal (VP) shunt placement have been reported (9, 16, 20, 22, 31). With infections and obstruction being the most common (10, 22, 29, 31). Intraabdominal complications are relatively rare (13), but one of is extrusion of the shunt catheter from the abdominal cavity (7, 11, 14, 15, 17, 29, 30, 34, 35).

The Raimondi spring wire catheter and less flexible silicon catheters have been implicated in most cases of extrusion or perforation (1, 8, 15, 17, 19, 21, 24, 26, 27, 28, 31). However in several cases Holter and Pudenz catheters were reported to cause such complications (11). Other causal factors have also been implicated in extrusion of the shunt from the abdominal cavity (18, 29, 33).

In this report a case of migration of a Pudenz type peritoneal catheter into the abdominal wall at the right flank is presented, and the mechanism of this rare complication is discussed.

CASE REPORT

A 4-year-old-girl was admitted on September 17, 1992 with episodes of fever and swelling at the right flank.

A medium pressure ventriculoperitoneal shunt with a Pudenz valve had been inserted for treatment of communicating hydrocephalus secondary to tuberculous meningitis 3 years previously and antituberculosis drugs had been used for 1.5 years.

At admission, physical examination a painful cystic mass with fluctuation at the right flank was palpated. Right parietal scalp and subcostal abdominal skin incision scars secondary to V-P shunt placement were also observed.

Neurological examination was normal except mental retardation.

Initial laboratory evaluation included: Haemoglobin 12,1 gram /100 ml, leucocyte count 13 800 /mm3. Chest X-ray was normal. Cerebrospinal fluid (CSF) contained 56 mg of glucose, 187 mg protein and 110 mg of chloride per 100 ml. Gram stain of the cerebrospinal fluid revealed no organisms. Electrolites were also within normal limits. Body temperature was 38.5 0C and sedimentation rate 20 mm/ hour.

Abdominal CT revealed a cystic mass in the abdominal wall at the right flank containing the tip

of the distal catheter of a V-P shunt (Fig. 1, Fig. 2), located about 5 cm from the subcostal incision posteriorly. When the wall of the cystic mass was incised infected material and the tip of the V-P shunt were encountered. After draining the infected material CSF dropping was seen at the tip of the distal catheter. Microscopic examination of the cystic fluid showed pleocytosis. Staining for Koch bacilli (Zeil-Nielsen) was negative as was the culture of infected material from the cystic cavity.

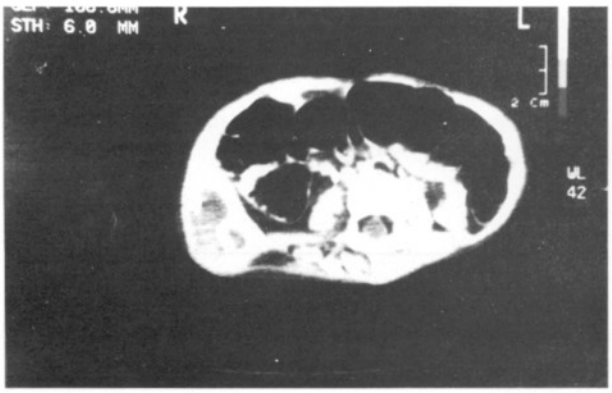

Fig. 1. CT of the cystic maas in the abdominal wall at the right flank containing distal tip of the peritoneal catheter.

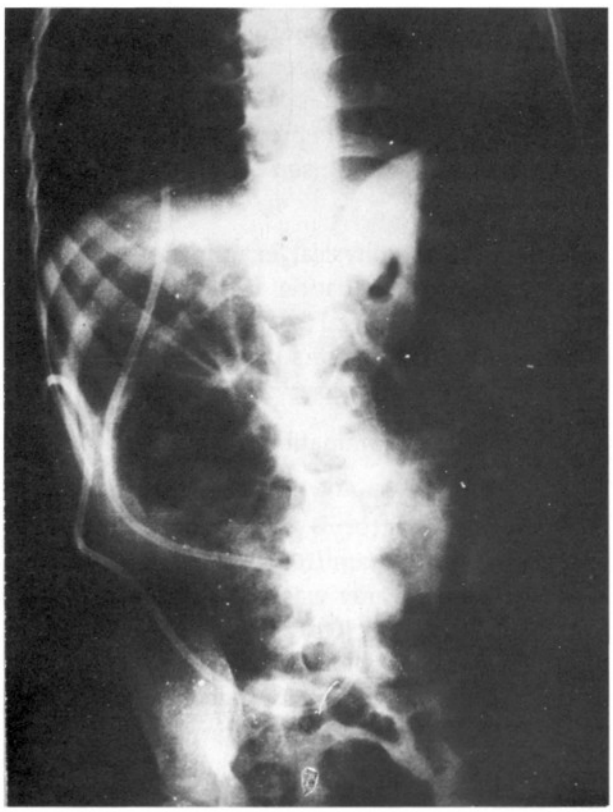

Fig. 2. Direct X-ray of peritoneal catheter. The tip of the catheter is seen at the right flank.

The peritoneal and ventricular catheters of the shunt were removed. Seftazidim was given 20 mg/kg for 20 days postoperatively. The postoperative course was uneventful.

DISCUSSION

Intra abdominal complications associated with ventriculoperitoneal shunt are relatively rare. These include pseudocyst formation (3, 4, 13), bowel obstruction (9, 16, 23), migration of disconnected shunt (9, 12, 16, 23, 35), intractable acides (9, 29), perforation of viscera (1, 3, 13, 16, 23, 35), transdiaphragm migration (17), urethra obstruction (6), inguinal hernia (13), intrascrotal extrusion (25, 29), vaginal perforation (21, 26), umblical perforation (2), and shunt extrusion (34).

Peritoneal catheters have been reported to extrude from the abdominal cavity through the flank (15), diaphragm (7, 11, 17), intestine (5, 29, 30), neck (34), umblicus (2), uterus (14), vagina (21,26), abdominal incision or into the liver (28), or scrotum (20, 27). Less flexible catheters Raimondi spring wire or simple silastic have been implicated in most reported cases of extrusion (1, 15, 17, 19, 21, 28, 30) and extrusion of more flexible peritoneal catheters Holter and Pudenz from the abdominal cavity have also been reported occurred (11, 15, 29, 30).

Some authors indicate the effect of anatomical defects in the abdominal wall or diaphragm on extrusion of the shunt from the abdominal cavity (7, 33). The spring wire makes the catheter stiffer and less likely to kink, but it also seems to make it more likely to erode adjacent structures and extrude (19). Another factor in the mechanism of perforation of the abdominal wall in such cases is the presence of a foreign body in the abdominal cavity (18, 29).

Rubin suggested that the possible anchoring effect of fibrous encasement of the peritoneal end of the tube may result in repeated pressure by the tip at a fixed point on the bowel surface, eventually leading to organ perforation (29). Necrosis of the organ wall due to continuous contact with the peritoneal tube and infection at this site are other causes of perforation or extrusion (32). Diminished bowel peristaltic activity in elderly patients contributes to prolonged continuous contact of the tube with the abdominal wall (32).

In our case, the Pudenz type soft peritoneal catheter probably caused local infection and necrosis of the inner surface of the abdominal wall initially and the pulsatile effecf of fluid and intestinal peristalsis eventually led to migration of the catheter into the abdominal wall and cystic dilatation.

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