

Surgical complications after Tenckhoff catheter implant

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Abstract

Peritoneal dialysis is one of the three basic methods of renal replacement therapy. It allows the patient to perform dialysis at home while maintaining the basic principles of asepsis. It involves the permanent introduction of a dialysis catheter into the peritoneal cavity. Surgical procedure is not complicated, however, as any intervention may carry the risk of complications. Depending on the time of diagnosis, complications are divided into early, up to 30 days after surgery and late - over 30 days after surgery. This paper aims to present the most common surgical complications associated with Tenckhoff catheter implantation.

Key words: Peritoneal dialysis, Tenckhoff catheter, complications

Implantation:

The correct implantation of a peritoneal dialysis (PD) catheter is the basis for its proper function and thus the effectiveness of peritoneal dialysis. It affects not only the early but also distant results of treatment (1). The procedure should meet all the requirements of a medical procedure: be safe for the patient and simple to perform. (2). There are several techniques for introducing peritoneal dialysis (PD) catheters into the abdominal cavity. Open and laparoscopic surgical techniques are preferred because of their safety and good results after implantation. Laparoscopic technique is becoming more and more popular due to the possibility of releasing intraperitoneal adhesions during catheter implantation. The transdermal method is associated with the risk of inaccurate catheter insertion and internal organ damage, and is only reserved for exceptional cases.

Early complications:

Complications arising shortly after implantation of the catheter are often associated with the procedure itself, congenital anatomical defects, and / or increased intra-abdominal pressure (IAP) generated by infusion of dialysate into the peritoneal cavity (3).

Pain:

Patients often experience mild pain after the catheter insertion procedure. They may also complain of deep pain that may be due to intestinal traction caused by catheter manipulation during surgery. The infusion of dialysate solution may cause severe pain gradually. The three main causes of infusion pain include: 1) hypersensitivity to the low pH of the dialysate solution; 2) placing the catheter in functional or anatomical compartments; and 3) the position of the catheter tip relative to the pelvic, bladder, or rectal wall. If the pain appears to be

related to the position of the catheter tip, you can use a shorter catheter or you can change the position of the catheter tip to solve the problem. Air supply when introducing or connecting a catheter may cause temporary pain (4).

Bleeding:

A common cause of bleeding is damage to the lower epigastric artery. Damage can occur when a needle is inserted into a blood vessel, which can be easily detected. In these cases, removing the needle may be sufficient to control the bleeding. A venous wound may also occur; however, the venous wound is more difficult to diagnose compared to the arterial wound due to less bleeding, often invisible during general anesthesia and low pressure with the supply of sedative drugs. All types of cuts (arterial or venous) require rapid action and may require ligation of damaged vessels. Bleeding can also occur after a visceral puncture, although it is less common. Blood may appear in the dialysis catheter, but drainage should return to normal within a few days. Very rarely, bleeding may require revision of the wound (5).

Perforation:

Intestinal perforation is rare in approximately 1% of patients and usually begins when entering the abdominal cavity or when inserting a catheter with a stylet into the lower abdomen. Perforation is suspected with severe pain, nausea or peritoneal symptoms.

The most obvious signs of perforation are: the return of intestinal or urine content through a catheter or mandrin, the hissing sound of gas coming out, the stinking smell of feces, the immediate need to urinate or discharge from the vagina of peritoneal fluid. Symptoms of perforation of the small intestine or bladder after blind catheter insertion may remain silent for some time after surgery and may be associated with good initial catheter function, making the diagnosis more elusive. Surgical repair of the perforation site and intravenous antibiotic therapy are mandatory (6).

Leaks:

Leakage of dialysate can be counted off by draining fluid from the exit site or with the appearance of bulging under the entry site. The causes of leaks may be due to a hernia at the entrance site as a result of a very large incision, the placement of a proximal cuff on the rectus

abdominis muscle and injury. Suspending peritoneal dialysis for several weeks will most likely solve this problem. Usually temporary HD treatment is required.

Others:

Difficulties in the outflow of dialysis fluid can be caused by many problems. Most often these are blood clots or fibrin in the catheter, collapse of the subcutaneous tunnel or greater omentum around the catheter. Clogged catheters are attempted to be unblocked with heparin or urokinase solutions, however, the effectiveness of this action does not exceed 50%. (7, 8). Incorrect positioning of the epigastric catheter can usually cause pain and sometimes no outflow. A simple radiological examination is sufficient to visualize the position of the catheter tip. Laparoscopic repositioning with the catheter attached to the lower abdomen may be the best way to solve this problem. Preventing the wrong position of the catheter remains the main goal and can be corrected using laparoscopic technique and proper measurement of the length of the catheter. (9) The most common causes of sexual edema are extravasation of the fluid into the peritoneal space. Diagnosis can be easily confirmed by scintigraphy with contrast material or computed tomography. Surgical correction is the most effective and allows in most cases the continuation of PD.

Early peritonitis after catheter insertion may be a sign of poor surgical technique. If the peritoneal fluid becomes cloudy, which is associated with pain, then the dialysate should be sent for microbiological examination and appropriate antibiotics should be given. Elimination of nasal staphylococci by mupirocin and antibiotic prophylaxis with vancomycin can significantly reduce the incidence of early peritonitis (10).

Late complications:

Late complications (> 30 days) include infection at the exit site, tunnel infection, cuff protrusion, outflow failure, dialysate leakage and hernia. The frequency of infections associated with positioning at the exit site can be reduced by placing the catheter appropriately. Irritation or even the cuff may extend when the exit is directly below the waist line. Superficial cuffs close to the skin may be susceptible to squeezing and infection. An upward direction can accumulate fluid, which leads to more frequent infections. Catheter replacement is indicated in most cases and can be done in one session, with the emphasis on choosing a different exit site through the skin for the new catheter.

Outflow failure over 30 days is quite likely due to constipation and is relieved by laxatives. Leaks and hernias may manifest due to increased intra-abdominal pressure secondary to the presence of dialysate. Temporary nocturnal automatic PD can be used to reduce leakage in patients with residual renal function. Leaks can also result from umbilical hernia or the presence of retroperitoneal leakage, which causes scrotal edema. Surgical hernia repair may be indicated by a temporary change to hemodialysis (HD) for proper wound healing (11).

Peritonitis is a serious problem for patients with PD and the main reason patients switch to HD. Peritonitis often results from skin contamination. In addition, Gram-negative bacteria associated with diarrhea or diverticulitis may be causative organisms. Diagnosis and treatment of peritonitis associated with PD is simple. Patients suffer from abdominal pain, sometimes accompanied by fever. The number of white blood cells in PD fluid and cultures can reveal leukocytes and bacteria. Systemic or intraperitoneal antibiotics are administered, depending on the cultured organisms, and the exchange volume is reduced. Usually PD associated peritonitis resolves after appropriate treatment. In the case of a persistent infection, removal of the catheter and transition to HD for 4-6 weeks is sufficient to resolve peritonitis (12).

Summary:

As the above article shows, the procedure for placing a catheter for peritoneal dialysis is not complicated. However, it can be associated with any complications whose early detection and repair is one of the basic tasks of the surgeon performing the operation

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