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TRICK OF THE TRADE

The reverse leak test for the assessment of low coloanal anastomosis: technical note

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Anastomotic leakage (AL) following colorectal anastomosis is one of the most dreaded complications of colorectal surgery. The negative impact of AL is not only restricted to the early morbidity and mortality related to the associated sepsis and systemic inflammatory response, but it can also extend to compromise long-term functional and oncologic outcomes [1, 2].

To prevent or at least reduce the incidence of AL, a number of methods have been described to ensure the competency and adequate perfusion of the anastomosis. The intraoperative air leak test is a frequently used method to identify mechanically insufficient colorectal anastomosis. In this test, the pelvis is filled with saline solution and the rectum is insufflated with air through a sigmoidoscope or a rectal tube, and the presence of air bubbles in the pelvis indicates AL [3–5]. Intraoperative endoscopic visualization of the anastomosis is another viable method to ensure mechanical competency of the anastomosis [6]. Another, more recent, method is indocyanine green fluorescence angiography, which is reportedly associated with reduced rates of AL and a change in the surgical plan in up to 13% of cases [7, 8].

However, it is not feasible to use the standard air leak test to assess the integrity of low coloanal anastomosis after restorative proctectomy. Hence, came the idea of the reverse leak test in which one surgeon fills the pelvis with saline solution while the patient is placed in the reverse Trendelenburg position (Fig. 1). Another surgeon transanally evaluates the anastomotic line. The presence of water leaking between the anastomotic line sutures (Fig. 2) is indicative of AL and necessitates reinforcement of the anastomosis with sutures until the fluid leak ceases (Fig. 3). This finding is more easily recognized during laparoscopy where the pneumoperitoneum helps force fluid mixed with gas from between the sutures.

While with the standard air leak test air is injected through the rectum and air bubbles are noticed in the pelvis, the opposite is done for the reverse leak test, wherein the fluid in the pelvis allows leakage to be noted through the anal canal—thus the name "reverse".

In conclusion, the reverse leak test is a simple, feasible method of assessing the integrity of the transanal coloanal anastomosis for both open and laparoscopic restorative

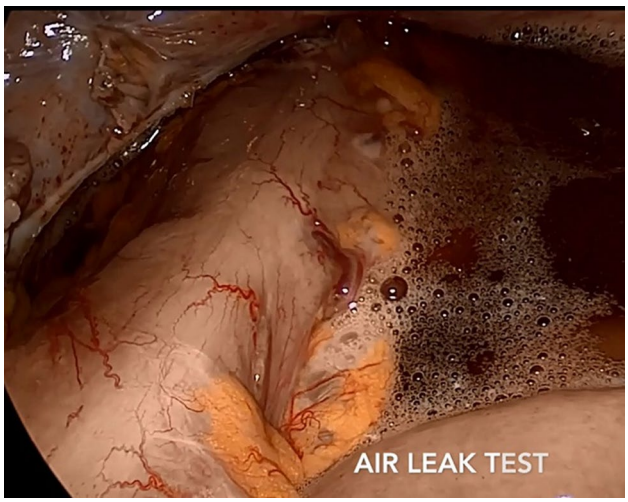

Fig. 1 Filling the pelvis with normal saline solution

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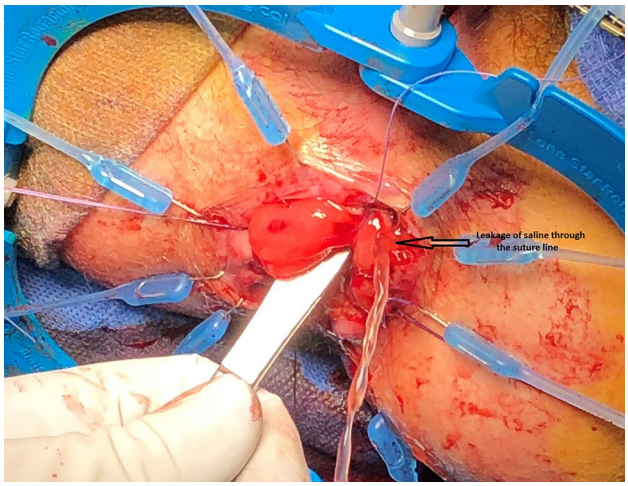

Fig. 2 Positive reverse leak test with leakage of saline solution through the suture line indicating the need to reinforce the anastomosis with additional sutures

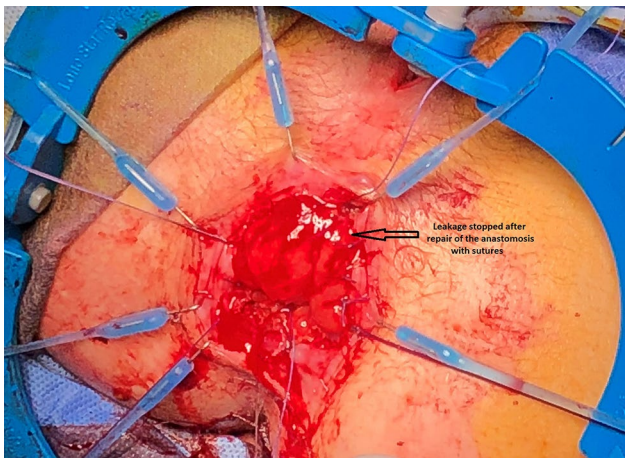

Fig. 3 Stoppage of fluid leakage through the suture line after reinforcement of the anastomosis with sutures

proctectomy. Given the advantages of this test, it can be a useful tool in the armamentairum of the colorectal surgeon to help reduce the incidence of AL.

Compliance with ethical standards

Conflict of interest The author(s) declare that they have no competing interests.

Ethical approval For this type of study ethical approval is not required.

Informed consent For this type of study formal consent is not required.

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