Colorectal anastomotic leakage: an ongoing mystery

Whenever people are diagnosed with an intestinal disease such as Crohn, Colitis or colorectal cancer, they might need to undergo surgery to remove the affected part of the intestine. During such surgery, the remaining parts of the intestine are sutured (or stapled) back together, resulting in an anastomosis. One of the most dreaded complications of this type of surgery is anastomotic leakage (in 3-14% of all cases), which causes the intestinal content to leak into the abdominal cavity leading to severe morbidity and even mortality. Furthermore, anastomotic leakage has a huge impact on the quality of life and doubles the amount of hospital admittances.

A lot of research is being performed to reduce the clinical burden of anastomotic leakage; especially preventive measures to strengthen or seal the anastomosis are extensively being investigated. For this purpose, animal models are currently being used to develop an intervention that may lead to a reduction of anastomotic leakage. However, we still don't know exactly what causes anastomotic leakage, which seems a bit odd. Should solving the mystery of anastomotic leakage not start with investigating its pathophysiology?
Researchers and physicians are convinced that anastomotic leakage results from a disturbed-healing process of the anastomosis, although nobody quite knows how this healing takes place. Of course, some risk factors are known: smoking; male gender; or the use of non-steroidal anti-inflammatory drugs around the time of surgery all lead to a higher risk of anastomotic leakage. It is also contemplated that an anastomosis should have good vascularization and not be constructed with severe tension on it. However, there is still a lot of debate regarding specific subjects in anastomotic leakage, both in clinical practice and in translational research.

Recently, the majority of colorectal anastomoses are constructed by means of a stapler, instead of being hand-sewn by the surgeon. Some people believe that the technique of the surgeon is the main cause of why some anastomoses leak and others do not. Stapling the anastomoses would lead to more standardization of technique and therefore would have better outcomes compared to suturing. These techniques have been compared and thus far no big advantage is reported from one technique over the other.

That's why there is still a lot of discussion amongst researchers and surgeons, especially on four topics: which layer in the intestinal wall is most important in anastomotic healing; if intestinal healing can be compared to healing of the skin; if bacteria play a role in the pathogenesis of anastomotic leakage; and if surrogate markers that are currently being investigated truly provide information regarding anastomotic healing,

No answers have been provided on these matters in current literature, which is one of the reasons why anastomotic leakage still exist in 10% of all patients that undergo colorectal surgery. We believe that if the complicated biological process of anastomotic healing will be fully elucidated, it may be possible to develop interventions that can stimulate anastomotic healing and subsequently prevent anastomotic leakage. This can positively influence the quality and decrease the quantity of

animal research on anastomotic leakage in the short term and hopefully reduce the clinical burden of anastomotic leakage in the long term.

Joanna Bosmans
Department of Surgery, NUTRIM School for Nutrition & Translational Research in Metabolism, Maastricht University Medical Center, Maastricht, the Netherlands

Publication

Colorectal anastomotic healing: why the biological processes that lead to anastomotic leakage should be revealed prior to conducting intervention studies.
Bosmans JW, Jongen AC, Bouvy ND, Derikx JP
BMC Gastroenterol. 2015 Dec 21