Why do surgeons make stomas?

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The term 'stoma' comes from the Greek word meaning mouth, or opening. There are many different types of naturally occurring openings in the human body which may be described as stoma, but this article deals with the surgically created variety, particularly ileostomies and colostomies.

Historical background

In early Greek and Roman times, some doctors – including the famous Hippocrates (460–367 BC) – knew that injuries to the colon and small bowel were invariably fatal; but they did not know why, and had no way of preventing the deaths. Things changed little over the next millennium, although it was recognised that occasionally a strangulated hernia (a protruding part of the bowel that has lost its blood supply) would break down, leaving a loop of bowel at the skin surface, which was effectively a stoma, and that other injuries could result in the creation of a natural colostomy.

In 1706, a soldier at the battle of Ramilles (one of the battles of the War of the Spanish Succession) suffered an injury to his lower back, which caused his colon to protrude through the wound. He developed an abnormal passageway known as a colonic fistula, and lived for 14 years after the injury.

The earliest reports of surgical formation of a colostomy date from 1710, when Litre suggested colostomy as a treatment for the intestinal obstruction caused by a condition known as congenital anal atresia (a birth defect where the anus fails to develop). Over the next hundred years this was the main reason for colostomy formation, but records suggest that few patients survived the procedure. Initially, many of these colostomies were sited in the patient's side rather than on the front of the abdomen. The appliances used to drain these early colostomies were tin boxes held in position by truss-like straps. These were later modified and were made from rubber anaesthetic tubing.

Ileostomies are a much more recent development, which largely came about following the realisation that surgery could be an effective treatment for severe ulcerative colitis. This procedure requires removal of part, or all, of the colon and is called a colectomy. As recently as 1940, surgeons were uncertain about the feasibility of colectomy on account of the technical difficulties of the procedure and the problem of postoperative care. By the 1950s, however, anaesthetics and postoperative care had improved, and colectomy with ileostomy formation became more common. At this time, ileostomies tended to be at least 15 cm long to allow faeces to be diverted into the appliance without wearing away the skin. The ileostomy had to be stretched on a regular basis to prevent the opening from becoming too narrow and closing up. Some surgeons attempted to overcome these difficulties by applying skin grafts to the surface of the ileostomy, but this met with only limited success. However, in 1952, Bryan Brooke showed that skin grafts were not particularly helpful, but that turning the end of the ileum inside out and stitching it to the skin could resolve most of the problems. This technique is still used today.

Fortunately, the safety of surgery and our ability to look after postoperative patients have improved dramatically over the past 50 years. While the formation of a colostomy or ileostomy is now considered to be a routine and relatively low-risk procedure, the decision to carry one out is not taken lightly. Formation of a stoma may cause considerable disruption to the patient's lifestyle and their physical and psychological wellbeing.

Early surgery. Before the 1950s, when surgery and anaesthetics became more sophisticated, ileostomies were rare

Rationale for stoma formation

A variety of conditions require the formation of a stoma. Since all patients are individuals and have to be treated as such, the following descriptions may contain some generalisations which do not apply to everyone.

Colorectal cancer

In the UK, approximately one third of bowel cancers are first seen by medical staff only after they have become emergencies. The most common emergency is peritonitis (inflammation of the membrane that lines the abdominal cavity) due to perforation of the bowel, or intestinal obstruction. In the emergency situation there is an increased chance that a colostomy or ileostomy will be formed (probably around 40%, of which approximately half are never reversed). The message here is that if you have persistent bowel symptoms, you should see your doctor rather than let things continue to go untreated.

When bowel cancers are detected through investigation of symptoms,

surgery is usually the main treatment. In this 'elective' – as opposed to emergency – surgery a colostomy tends to be necessary only for cancers that occur low down in the pelvis (rectal cancers). This may be because a very low rectal tumour is too close to the anal muscles to allow the surgeon to preserve them and reconnect the bowel. However, a temporary colostomy or ileostomy may be needed even when the bowel has been reconnected if the join is low in the pelvis. This type of stoma is often referred to as a 'defunctioning' stoma as it diverts the faeces away from the join and allows it to heal more safely. Such stomas are usually temporary and can be closed about six to 12 weeks after the initial surgery.

Inflammatory bowel disease

The Brooke ileostomy revolutionised the surgical treatment of ulcerative colitis, and when medical treatment fails to control this condition, colectomy and formation of an ileostomy is still the procedure of choice for most patients. This allows the patient to regain their quality of life, and for some no further surgery is indicated.

Some patients with ulcerative colitis are keen to avoid a stoma and in these, further surgery to form an ileal pouch and remove the diseased rectum is a logical next step. Pouch surgery can massively improve the quality of life for the majority of patients with chronic ulcerative colitis, but unfortunately, about 10% of patients find it difficult to get used to life with a pouch or have complications following pouch formation, which subsequently leads to poor pouch function. Since the surgically created connection between the pouch and the anus is crucial to the subsequent function of the pouch, many surgeons prefer to perform a defunctioning ileostomy at the same time as carrying out the operation to form the pouch; this allows the pouch and the join to heal. The ileostomy is then closed a few months later.

Patients with Crohn's disease are usually not considered to be suitable for formation of an ileo-anal pouch. Stomas may be formed for patients who have Crohn's disease for a number of reasons, including:

- In an emergency situation, where surgery for fistula or perforation of the small or large bowel is required
- Severe infection in the area around the anus – to give the infection a chance to settle. An ileostomy or colostomy may be used
- Failure of medical treatment, where resection and reconnection of the bowel are not appropriate because the patient is very sick or has fully developed disease.

Damage to the bowel

In this country, damage to the bowel is most commonly caused by road traffic accidents (often due to seat belt restraint). Gunshot and knife wound injuries can also cause injury to the bowel. In some cases it is possible to cut out the damaged part of the bowel and join the ends together. However, if the injury results in severe contamination of the abdominal cavity, it is unsafe to join the bowel ends, since infection arising from the contamination increases the risk that the join will not heal. In these circumstances, a temporary stoma may be lifesaving.

Rectal fistulae

The most common type of fistula in this context is an abnormal opening between the skin and the bowel. These can be very troublesome and may require the formation of a defunctioning stoma. Examples of situations in which a temporary colostomy (or ileostomy) may be required are:

- Following peritonitis caused by bowel perforation (Crohn's disease or inflammation of the intestine, usually accompanied by diarrhoea)
- Severe Crohn's disease
- A high anal fistula, the correction of which requires a procedure called 'advancement flap' repair.

Incontinence

Formation of a colostomy for incontinence is viewed almost as an admission of defeat, and is a last resort treatment, only undertaken when all else has failed. In some of the newer and more complex procedures used to treat anal incontinence, a temporary colostomy is normally used to reduce the risk of infection and to give the repaired area time to heal before it is exposed to faeces.

What the future holds

While the formation of a stoma can be distressing to patients (and expensive for the NHS), it may also be life saving, particularly in emergency surgery. In some patients, the use of a temporary stoma to divert faeces allows surgeons to undertake complex bowel surgery – for example, ileal pouches – with increased safety. Increasingly, surgeons are striving to create fewer stomas, and new developments in the techniques of joining pieces of bowel together and advances in keyhole surgery have helped in this quest.

While it seems likely that there will always be some patients who will require a temporary stoma, the goal of reducing the number of patients who have to have permanent stomas seems to be a realistic one.

Key points

- **While the formation of a colostomy or ileostomy is now considered to be a routine and relatively low-risk procedure, the decision to carry one out is not taken lightly.**
- **While the formation of a stoma can be distressing to patients (and expensive for the NHS), it may also be lifesaving, particularly in emergency surgery!**