Capsule endoscopy

Capsule endoscopy

The prototype capsule endoscope was developed at the Royal London Hospital in the UK by Professor Paul Swain. Several companies have developed di ff erent systems for routine clinical use, but the basic principles remain identical. The technique requires three main components: an ingestible capsule, a portable data recorder and a workstation equipped with image-processing software. The capsule consists of an optical dome and lens, two light-emitting diodes, a processor, a battery , a transmitter, and an antenna encased in a resistant coat the size of a large vitamin pill (Figure 9.11). It acquires video images during natural propulsion through the digestive system that it transmits via a digital radiofrequency communication channel to the recorder unit worn outside the body; this also contains sensors that allow basic localisation of the site of image capture within the abdomen. Upon completion of the Christopher Paul Swain , b. 1943, gastroenterologist, The Royal London Hospital, London, UK. Burrill Bernard Crohn , 1884–1983, gastroenterologist, Mount Sinai Hospital, New Y ork, NY , USA, described regional ileitis in 1932. - - - - examination, the physician transfers the accumulated data to the workstation for interpretation via a high-capacity digital link. The workstation is a modified personal computer required ms of for o ff -line data storage, interpretation and analysis of the acquired images and report generation. The small bowel capsule provides good visualisation from mouth to colon with a high diagnostic yield. It compares - favourably with other techniques for localisation of occult gastrointestinal bleeding and the diagnosis of small bowel Crohn’s disease. Use of the capsule endoscope is contra - - indicated in patients with known small bowel strictures in which le - it may impact, resulting in acute obstruction and requiring retrieval at laparotomy or via laparoscopy . Se vere gastroparesis and pseudo-obstruction are also relative contraindications to its use. Some units advocate a barium follow-through or small bowel MRI to exclude stricturing disease in all patients before capsule endoscopy . However, there are well-reported episodes of capsule impaction in a stricture that was not visualised on prior imaging. Therefore, a ‘dummy’ patency capsule that can be tracked via a handheld device or conventional radiology as it passes through the intestine should be used in all patients in whom there is a possibility of stricturing disease. The patency capsule will dissolve after 40 hours if it becomes impacted. Technology in this field is rapidly advancing, with capsule sys - tems now available to image the colon.

disadvantages of the currently available modalities to endoscope the small intestine. Technique Advantages Disadvantages Some discomfort Conventional Simple technique with Can only access enteroscopy wide availability proximal small bowel Full range of therapeutics available Performed under sedation No biopsies Capsule Able to visualise the Not controllable and no endoscopy entire small bowel accurate localisation Preferable for patients Variable transit No sedation Incomplete studies Painless owing to battery life Not suitable for patients with strictures Large capsule to swallow Requires admission Able to visualise the Double-/ Specialist centres only entire small bowel single-balloon Complications include Full range of enteroscopy perforation therapeutics

Capsule endoscopy

The prototype capsule endoscope was developed at the Royal London Hospital in the UK by Professor Paul Swain. Several companies have developed di ff erent systems for routine clinical use, but the basic principles remain identical. The technique requires three main components: an ingestible capsule, a portable data recorder and a workstation equipped with image-processing software. The capsule consists of an optical dome and lens, two light-emitting diodes, a processor, a battery , a transmitter, and an antenna encased in a resistant coat the size of a large vitamin pill (Figure 9.11). It acquires video images during natural propulsion through the digestive system that it transmits via a digital radiofrequency communication channel to the recorder unit worn outside the body; this also contains sensors that allow basic localisation of the site of image capture within the abdomen. Upon completion of the Christopher Paul Swain , b. 1943, gastroenterologist, The Royal London Hospital, London, UK. Burrill Bernard Crohn , 1884–1983, gastroenterologist, Mount Sinai Hospital, New Y ork, NY , USA, described regional ileitis in 1932. - - - - examination, the physician transfers the accumulated data to the workstation for interpretation via a high-capacity digital link. The workstation is a modified personal computer required ms of for o ff -line data storage, interpretation and analysis of the acquired images and report generation. The small bowel capsule provides good visualisation from mouth to colon with a high diagnostic yield. It compares - favourably with other techniques for localisation of occult gastrointestinal bleeding and the diagnosis of small bowel Crohn’s disease. Use of the capsule endoscope is contra - - indicated in patients with known small bowel strictures in which le - it may impact, resulting in acute obstruction and requiring retrieval at laparotomy or via laparoscopy . Se vere gastroparesis and pseudo-obstruction are also relative contraindications to its use. Some units advocate a barium follow-through or small bowel MRI to exclude stricturing disease in all patients before capsule endoscopy . However, there are well-reported episodes of capsule impaction in a stricture that was not visualised on prior imaging. Therefore, a ‘dummy’ patency capsule that can be tracked via a handheld device or conventional radiology as it passes through the intestine should be used in all patients in whom there is a possibility of stricturing disease. The patency capsule will dissolve after 40 hours if it becomes impacted. Technology in this field is rapidly advancing, with capsule sys - tems now available to image the colon.

disadvantages of the currently available modalities to endoscope the small intestine. Technique Advantages Disadvantages Some discomfort Conventional Simple technique with Can only access enteroscopy wide availability proximal small bowel Full range of therapeutics available Performed under sedation No biopsies Capsule Able to visualise the Not controllable and no endoscopy entire small bowel accurate localisation Preferable for patients Variable transit No sedation Incomplete studies Painless owing to battery life Not suitable for patients with strictures Large capsule to swallow Requires admission Able to visualise the Double-/ Specialist centres only entire small bowel single-balloon Complications include Full range of enteroscopy perforation therapeutics

Capsule endoscopy

The prototype capsule endoscope was developed at the Royal London Hospital in the UK by Professor Paul Swain. Several companies have developed di ff erent systems for routine clinical use, but the basic principles remain identical. The technique requires three main components: an ingestible capsule, a portable data recorder and a workstation equipped with image-processing

software. The capsule consists of an optical dome and lens, two light-emitting diodes, a processor, a battery , a transmitter, and an antenna encased in a resistant coat the size of a large vitamin pill (Figure 9.11). It acquires video images during natural propulsion through the digestive system that it transmits via a digital radiofrequency communication channel to the recorder unit worn outside the body; this also contains sensors that allow basic localisation of the site of image capture within the abdomen. Upon completion of the Christopher Paul Swain , b. 1943, gastroenterologist, The Royal London Hospital, London, UK. Burrill Bernard Crohn , 1884–1983, gastroenterologist, Mount Sinai Hospital, New Y ork, NY , USA, described regional ileitis in 1932. - - - - examination, the physician transfers the accumulated data to the workstation for interpretation via a high-capacity digital link. The workstation is a modified personal computer required ms of for o ff -line data storage, interpretation and analysis of the acquired images and report generation. The small bowel capsule provides good visualisation from mouth to colon with a high diagnostic yield. It compares - favourably with other techniques for localisation of occult gastrointestinal bleeding and the diagnosis of small bowel Crohn’s disease. Use of the capsule endoscope is contra - indicated in patients with known small bowel strictures in which le - it may impact, resulting in acute obstruction and requiring retrieval at laparotomy or via laparoscopy . Se vere gastroparesis and pseudo-obstruction are also relative contraindications to its use. Some units advocate a barium follow-through or small bowel MRI to exclude stricturing disease in all patients before capsule endoscopy . However, there are well-reported episodes of capsule impaction in a stricture that was not visualised on prior imaging. Therefore, a ‘dummy’ patency capsule that can be tracked via a handheld device or conventional radiology as it passes through the intestine should be used in all patients in whom there is a possibility of stricturing disease. The patency capsule will dissolve after 40 hours if it becomes impacted. Technology in this field is rapidly advancing, with capsule sys - tems now available to image the colon.

disadvantages of the currently available modalities to endoscope the small intestine. Technique Advantages Disadvantages Some discomfort Conventional Simple technique with Can only access enteroscopy wide availability proximal small bowel Full range of therapeutics available Performed under sedation No biopsies Capsule Able to visualise the Not controllable and no endoscopy entire small bowel accurate localisation Preferable for patients Variable transit No sedation Incomplete studies Painless owing to battery life Not suitable for patients with strictures Large capsule to swallow Requires admission Able to visualise the Double-/ Specialist centres only entire small bowel single-balloon Complications include Full range of enteroscopy perforation therapeutics

---

Revision #1
Created 2025-12-31 15:32:02 UTC by Omar Ayman
Updated 2025-12-31 15:32:02 UTC by Omar Ayman