Endoscopic appendicectomy: can it be done?

Acute appendicitis is a condition that will affect between 7% and 12% of humans at some point throughout the course of their lives.\(^1\) It remains the most common intra-abdominal emergency requiring surgical intervention. Treatment of acute appendicitis is well described in the literature with current evidence favouring laparoscopic over open techniques in the majority of patients.\(^2\) As the field of laparoscopic surgery improves, there is also increasing interest in natural orifice surgery (NOS). As the appendicle lumen is in direct connection with the caecum, it may just be feasible to remove the appendix by colonoscopy.

Brief literature review on Pubmed using the keywords “appendectomy” and “colonoscopy” yielded only 85 results. Only eight of these articles touched on the topic of removing the vermiform appendix with colonoscopy. One study performed by Silberhumer et al went as far as to design and instrument new devices for performing appendicectomy at colonoscopy.\(^1\) They undertook a prospective prototype development program study in 25 colons from adult human cadavers. Various prototypes were evaluated by inserting them into the lumen of the appendix with the aim of inverting the appendix into the caecal lumen.

A prototype that combined suction holes and grabbing of the appendicle tip proved to be the most effective. The procedure was separated into five parts: placement of the colonoscope and overtube, appendicle imaging, inversion of the appendix, ligation, and removal of the appendix. It was noted that in 22 out of 25 tests partial inversion of the appendix was successful. The volume and tension of the mesoappendix secondary to fat deposit proved the main reason for incomplete inversion. However this was overcome in the majority of cases by an endoluminal longitudinal incision at the mesenteric side of the partially inverted appendix.

Whilst the above study is exciting and potentially opens the door to a new intervention in the management of acute appendicitis, it is vital to identify the limitations and challenges of such a procedure. Certainly the technology required such as a suture ligation mechanism and tubular structure to insert into the appendicle lumen for inversion must be further developed.

As this procedure is currently described it could not be used in the management of acute appendicitis. Oedematous tissue would likely obstruct the lumen of the appendix thus creating a barrier to the insertion of the vacuum tube. Also the risk of perforation of the appendix may be higher secondary to the fragility of the wall in acute inflammation. In the case of perforated acute appendicitis a laparoscopic or open technique would still be required.

Advantages of colonoscopy assisted appendicectomy are certainly great. Avoiding abdominal wall incisions will presumably result in less post-operative pain secondary to the avoidance of injury to the abdominal wall layers and parietal peritoneum. Once the appendix is inverted this procedure may be likened to that of polypectomy and thus nil general anaesthetic would be required.\(^3\)
As a result procedures may be able to be performed in the outpatient setting, thus freeing up more time in the operating theatre for other cases. There are a number of cases in the literature that describe successful colonoscopy assisted removal of intussuscepted appendices.\(^1\) Therefore if inversion of the appendix is made possible then there is literature to support completion colonoscopic appendicectomy. Uncertainty still remains as to the usefulness of this procedure in the clinical setting. It has been outlined above that this procedure is not appropriate in the setting of acute appendicitis. Said et al present a case of missed appendicitis whereby colonoscopy was performed as a diagnostic investigation following normal abdominal ultrasound scan and gastroscopy.\(^4\) Colonoscopy was performed and an inflamed appendiceal orifice was seen and intubated using an endoscopic retrograde cholangio-pancreatography (ERCP) catheter and pus was aspirated. Following this the patients symptoms improved and they underwent an elective appendicectomy five months later. Avoidance of surgery in the setting of acute appendicitis in certain patients via the use of antibiotics is another option that is controversial, though supported by some of the literature.\(^5\) If acute appendicitis was able to be managed with the above non-surgical techniques then certainly there would be a place for colonoscopy assisted appendicectomy in the outpatient setting.

It is still early days in the development of the technique of colonoscopy assisted appendicectomy. There is much more research to be done and technology to be developed. However in answer to the question “can it be done?” Well the answer is most certainly yes and the potential benefits that this procedure may offer in the future are certainly worth pursuing.

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References: