



# Closure of the appendix stump in laparoscopic appendicectomy

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Acute appendicitis is a common disease with a prevalence of 12% in Western Europe (1). Laparoscopic appendicectomy has been recently suggested to be the “golden standard” treatment of acute appendicitis (2). Nevertheless, laparoscopic appendicectomy has been postulated to be associated with an increased incidence of postoperative intra-abdominal abscess. The method of closure of the appendix stump in laparoscopic appendicectomy may affect the risk of this complication. Surgical options include ligation of the stump using simple or pre-tied sutures (endoloops), staplers and clips.

In their recently published randomised controlled trial (RCT), Delibegović and colleagues compare four methods of securing the appendix stump (3). The authors have randomised 120 patients with acute appendicitis to endoloop, stapler, metal or plastic locking clip (Hem-o-lok). The authors reported no perioperative morbidity. The study findings may be synthesised in longer operative times for endoloop closure and similar duration of hospital stay across the treatment arms.

The report by Delibegović and colleagues is of specific scientific importance for two reasons. First, it is one of a few RCTs having directly compared ligation methods in laparoscopic appendicectomy (4-7), and the first trial to compare four different methods. Second, it highlights shortcomings of current methodology in relation to this subject, more specifically the need for sample size calculation, adequate duration and method of follow up, and a multi-centric design.

In a systematic review of RCTs by our evidence synthesis group, we found few head-to-head comparisons of different

ligation methods, but we identified a large number of RCTs having compared open surgery with suture, endoloop, stapler or clip ligation (8). We therefore applied the network meta-analysis concept and computed the relative treatment effect and the interval estimates of ligation methods, based on both direct and indirect evidence. Furthermore, we came to an evidence-based treatment ranking, based on the surface under the cumulative ranking curve (SUCRA). The analysis did not allow for definite conclusions, but it did suggest non inferiority for suture ligation of the appendix stump compared to endoloop, clip, or stapler ligation. In fact, suture ligation was ranked first among treatment options for the outcomes intra-abdominal abscess and wound infection. More importantly, this systematic review allowed identification of areas for future investigation, based on current evidence. More specifically:

- (I) Further direct comparative evidence on the effect of different ligation methods is needed. Considering the rarity of wound infection and intra-abdominal abscess, future RCTs need to be large-scaled and preferably be designed on a multicentre level.
- (II) The comparison between suture and clip ligation in acute appendicitis without inflammation of the appendix base needs to be prioritized.
- (III) The comparison between suture and stapler ligation in acute appendicitis with inflammation of the appendix base requires further investigation.

The need for stratification of patients in future trials, based on grade of inflammation and inflammatory involvement of the appendix base, cannot be overstated. Trialists must incorporate this information in their reporting

methodology to allow for applicability of research findings in surgical practice and facilitate future evidence synthesis. Until relevant research evidence becomes available, stapler ligation in complex cases with significant inflammation may be a prudent management option.

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