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Appendicitis and Appendectomy in Overweight and Obese Patients

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Background: Since laparoscopic appendectomy (LA) began to gain wide acceptance in the early 1990s, numerous studies have been done to explore its effectiveness compared to the open appendectomy (OA). Some studies have further explored the question of LA v. OA as it applies to the overweight and obese population. Preferences for LA in overweight patients have been described.¹ Overweight patients have also been found to have a reduced post-operative length of stay and faster post-operative recovery period following LA as compared to OA.² However, few studies have been done to characterize appendicitis and compare post-operative outcomes in the overweight and obese population compared to people with a normal body mass index (BMI).

Objectives: This retrospective chart review will explore the severity of appendicitis and the post-operative outcomes in OA as compared to LA in obese and overweight adult patients.

Methods: All charts of patients who received an appendectomy at the University of Massachusetts University Hospital and Memorial Hospital from October 1, 2005 to June 30, 2006 were reviewed retrospectively for the following data: height, weight, type of procedure (LA or OA), operative time, intra-operative findings, final pathological diagnosis, hours of symptoms prior to triage, total hospital days, and postoperative length of stay (LOS).

Results: Complete data was obtained for 145 charts out of 152 total charts. Three charts had no height documented; information from these charts was used in all analyses that did not include BMI. Twenty-nine (19.6%) were OAs, 115 (77.8%) were LAs, and 4 (2.7%) were conversions. There was no difference in the BMIs of the patients who received an LA v. an OA; patients who were converted had a higher average BMI (36.0 v. 27.8, $p = 0.0155$). Among these patients, 141 (95.3%) were found to have appendicitis, 5 (3.4%) were normal, and 2 (1.4%) had findings other than appendicitis.

Of patients found to have appendicitis, 103 (73.0%) were classified as acute uncomplicated and 38 (27%) as complicated (either gangrenous or perforated). Patients with complicated appendicitis had a higher average BMI compared to patients who presented with an acute uncomplicated appendicitis (30.10 v. 27.26, $p = 0.0261$). Patients with complicated appendicitis also had a higher average of hours of symptoms prior to triage compared to patients with acute appendicitis (61.63 v. 24.87, $p = 0$).

Average time for a laparoscopic procedure was 72 minutes, while open procedures lasted an average of 45.8 minutes ($p = 0$). Higher BMI was found to correlate with an increase in operative time for laparoscopic procedures ($r = 0.2284$, T stat = 3.20, p -value = 0.0017) but not open procedures.

There was no significant difference in postoperative LOS between patients who received LA v. OA ($p > 0.05$). However, patients who were converted from LA to OA had a longer post-

operative LOS (1.76 for LA v. 6.75 for conversion, $p = 0$). No correlation was found between BMI and length of post-operative stay following open or laparoscopic procedures. No significant difference in BMI was found among patients who were readmitted.

Conclusion: In this population, patients who presented with a complicated appendicitis had a higher average BMI and higher average hours of symptoms prior to triage than patients who presented with a non-complicated appendicitis. Patients who were converted from laparoscopic to open procedure had a higher average BMI and longer post-operative LOS than patients who were not converted. Higher BMI increased operative time in laparoscopic procedures. However, excluding conversions, BMI had no effect on postoperative LOS regardless of whether LA or OA was performed.

1. Maxwell JG, Robinson CL, Maxwell TG, et al. Deriving the indications for laparoscopic appendectomy from a comparison of the outcomes of laparoscopic and open appendectomy. *American Journal of Surgery*. 182(6):687-92, 2001 Dec.

2. Enochsson L, Hellberg A, Rudberg C, et al. Sorensen S. Wenner J. Laparoscopic vs open appendectomy in overweight patients. *Surgical Endoscopy*. 15(4):387-92, 2001 Apr.