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Laparoscopic approach on Perforated Peptic Ulcer (PPU): a new paradigm?

Background: Surgical treatment of Perforated Peptic Ulcer (PPU) by a laparoscopic approach has been performed slowly, remaining questions to answer about its usefulness in patients with severity criteria.

Aim: Compare 2 different surgical approaches (laparoscopy *vs.* laparotomy) in the treatment of PPU.

Methods: Retrospective, single institution, population-based study of all the patients who underwent surgery for Perforated Peptic Ulcer (PPU) between January 2010 and December 2017. It was done a *per-protocol* analysis and compared laparoscopy (n=49) with laparotomy (n=120, included 11 conversions): clinical-pathological characteristics, type of treatment and outcomes were evaluated. Severity disease assessment was done applying both Boey Score and Sepsis-3 criteria.

Results: PPU affects preferentially males (ratio 3:1), with a median age of 52 (range 21-97). A minimally invasive approach was fully performed in 49 (29%) patients. The conversion rate was 18,3% (11/60). When compared laparoscopy with laparotomy there were significant differences in sex (ratio male/female 7,2/1 *vs.* 2,2/1; p=0.009) and in the presence of sepsis criteria (12,2% *vs.* 38,3%; p=0.001). Laparoscopy presented a longer operative time when compared to the open surgery (median 100' *vs.* 80'; p=0.01), but was associated with lesser post-operative early complications (18,4% *vs.* 41,7%; p=0.004) and mortality (2% *vs.* 14,2%; p=0.02), lesser hospital stay (median 6 *vs.* 7 days; p=0.001) and earlier oral intake (median 3 *vs.* 4 days; p=0.021). This kind of approach reduced the risk of post-operative early complications in 68,5% (crude OR 0,315; CI95% 0,140 - 0,707; p=0.005) and mortality in 87,5% (crude OR 0,125; CI95% 0,016 - 0,967; p=0,046). However, when adjusted to the risk factors sex and age, laparoscopy wasn't associated with a reduced risk of post-operative complications (p=0.083) or mortality (p=0.131).

Discussion: A laparoscopic approach may be considered as a first-line procedure in the PPU surgical treatment if there is experience and resources available. This kind of approach is associated with a shorter length of hospital stay and earlier oral intake when compared with laparotomy. Sex and patient's age are risk factors for post-operative complications and mortality. In patients with sepsis criteria the laparoscopic approach looks promising, despite limited experience in these cases.