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REVIEW ARTICLE

A systematic review and meta-analysis of studies comparing laparoscopic and open distal pancreatectomy

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Abstract

Objectives: Currently, laparoscopic distal pancreatectomy (LDP) is regarded as a safe and effective surgical approach for lesions in the body and tail of the pancreas. This review compares outcomes of the laparoscopic technique with those of open distal pancreatectomy (ODP) and assesses the efficacy, safety and feasibility of each type of procedure.

Methods: Comparative studies published between January 1996 and April 2012 were included. Studies were selected based on specific inclusion and exclusion criteria. Evaluated endpoints were operative outcomes, postoperative recovery and postoperative complications.

Results: Fifteen non-randomized comparative studies that recruited a total of 1456 patients were analysed. Rates of conversion from LDP to open surgery ranged from 0% to 30%. Patients undergoing LDP had less intraoperative blood loss [weighted mean difference (WMD) –263.36.59 ml, 95% confidence interval (CI) –330.48 to –196.23 ml], fewer blood transfusions [odds ratio (OR) 0.28, 95% CI 0.11–0.76], shorter hospital stay (WMD –4.98 days, 95% CI –7.04 to –2.92 days), a higher rate of splenic preservation (OR 2.98, 95% CI 2.18–3.91), earlier oral intake (WMD –2.63 days, 95% CI –4.23 to 1.03 days) and fewer surgical site infections (OR 0.37, 95% CI 0.18–0.75). However, there were no differences between the two approaches with regard to operation time, time to first flatus and the occurrence of pancreatic fistula and other postoperative complications.

Conclusions: Laparoscopic resection results in improved operative and postoperative outcomes compared with open surgery according to the results of the present meta-analyses. It may be a safe and feasible option for patients with lesions in the body and tail of the pancreas. However, randomized controlled trials should be undertaken to confirm the relevance of these early findings.

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Introduction

Laparoscopic surgery is now widely accepted and recognized as a standard technique in many surgical procedures.[1,2] Initially, the laparoscopic approach was not commonly used in pancreatic resection; however, increasing experience means laparoscopic distal pancreatectomy (LDP) is now performed more frequently in the surgical management of benign, non-invasive and even malignant lesions in the body and tail of the pancreas.[3] Some studies have reported LDP to be associated with decreased intraoperative blood loss, a higher rate of splenic conservation, shorter hospital stay and less morbidity compared with open distal pancreatectomy (ODP).[4–6] By contrast, other studies report findings in favour of ODP.[7,8] Because these various reports indicate a discrepancy in the published literature, the present authors considered it necessary to summarize and analyse the published data to provide evidence to determine whether the literature supports the use of a laparoscopic approach as an alternative to open surgery in the resection of the distal pancreas.

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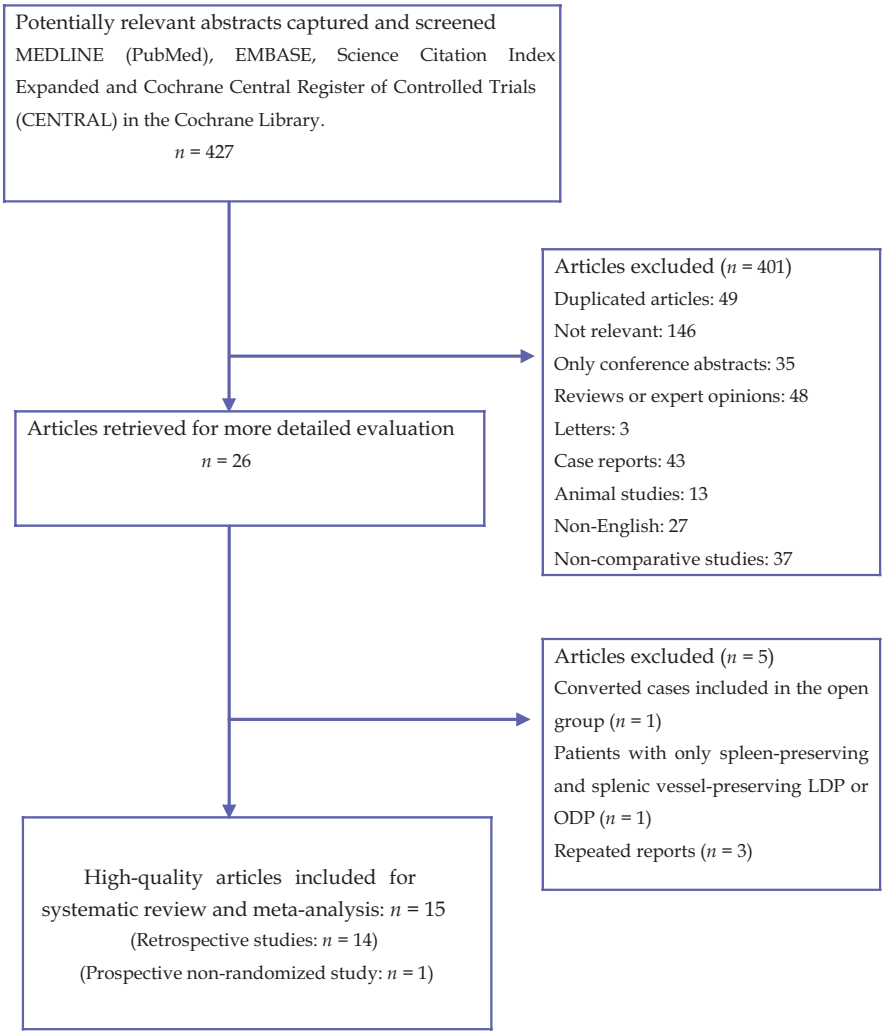

Figure 1 Flow diagram depicting the process of identifying and selecting studies for inclusion. LDP, laparoscopic distal pancreatectomy; OPD, open distal pancreatectomy

Materials and methods

Study selection

Major databases including PubMed (MEDLINE), EMBASE, the Science Citation Index Expanded and the Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library were searched for studies comparing outcomes in LDP and ODP, published in English from January 1996 to April 2012 (the first LDP was described in 1996). The medical search headings (MeSH) 'laparoscopy', 'pancreatectomy', 'comparative study' and combinations of these were used, as were the keywords 'laparoscopic', 'open distal pancreatic resection', 'left pancreatic resection', 'pancreatic surgery', 'distal pancreatectomy' and 'minimally invasive surgery'. The reference lists of articles identified were examined to find relevant studies that had not been identified by the database searches. Only comparative clinical trials with full-text descriptions were included. The final inclusion of articles was determined by consensus between authors TJ and KA; when this failed, a third author (JJX) adjudicated.

Inclusion and exclusion criteria

Two authors (TJ and KA) identified and screened the search findings for potentially eligible studies. Inclusion criteria required the studies to: (i) be written in English and published in peer-reviewed journals; (ii) be human studies; (iii) examine at least one of the predetermined outcomes, and (iv) provide clear documentation of the operative techniques as 'laparoscopic' or 'open'. In contexts in which multiple studies were published from the same institution and/or by the same authors, either the higher-quality study or the most recent publication was included in the analysis.

Exclusion criteria excluded: (i) abstracts, letters, editorials, expert opinions, case reports, reviews and studies lacking control groups; (ii) studies that included only patients undergoing spleen-