

Conversion of Failed J-Pouch to Kock Pouch: Indications, Contraindications, and Outcomes

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BACKGROUND: The IPAA has been successful in restoring intestinal continuity and preserving continence in the majority of patients requiring a proctocolectomy. However, a subset of individuals experience significant complications that might result in pouch failure. The conversion of the J-pouch to a continent ileostomy pouch represents a significant surgical procedure. In this article, we discuss the indications and contraindications, present the technical principles applied for the conversion, and describe the outcomes of such conversion in the literature.

OBJECTIVE: The main objective during the conversion of the J-pouch to a continent ileostomy is the creation of a sufficiently sized reservoir with a high-quality valve mechanism while preserving as much small bowel as possible.

CONCLUSIONS: The conversion of the J-pouch to a continent ileostomy represents a significant surgical procedure. When performed in centers of expertise, it can be a good option for patients who otherwise will require an end ileostomy. Indications for conversion include most cases of J-pouch failure, with a few important exceptions. **See video from symposium.**



KEY WORDS: Continent ileostomy; Crohn's disease; Ileal pouch; K-pouch; Kock pouch; Pouch failure; Restorative proctocolectomy; Surgery; Ulcerative colitis.

Bowel reconstructive surgery with ileal pouches plays a critical role in improving the quality of life for individuals who have undergone proctocolectomy because of conditions such as ulcerative colitis or familial adenomatous polyposis.¹ Two commonly used techniques that maintain continence after proctocolectomy are the IPAA and the continent ileostomy (K-pouch) procedures.²⁻⁴

The J-pouch is the most common configuration used for the IPAA procedure and has become the criterion standard for restoring bowel continuity after proctocolectomy.^{1,5,6} It is generally indicated in patients with ulcerative colitis and familial adenomatous polyposis who have failed medical management or present with complications, such as dysplasia or cancerous changes in the colon. It is particularly suitable for individuals who desire to avoid the long-term use of a stoma appliance and maintain the ability to pass stool through the anus. The J-pouch can provide excellent functional outcomes, allowing patients to regain control over bowel movements, experience reduced urgency, and achieve a higher degree of continence compared to other surgical options.⁶

Although the J-pouch has been successful in restoring intestinal continuity and preserving continence in the majority of patients, a subset of individuals experience significant complications or functional issues, such as pouchitis, incontinence, stricture, fistula, or poor pouch function.⁷⁻⁹ In some such cases, the conversion to a continent ileostomy (K-pouch) may be considered a viable option.¹⁰⁻¹³ Unlike the J-pouch, which creates a reservoir that is anastomosed to the anus, the K-pouch involves an intestinal reservoir that attaches to the abdominal wall. A nipple valve that is fashioned by intussusception of the efferent limb of the pouch acts as a 1-way continence mechanism that prevents leakage from the pouch.^{4,14} The pouch is intermittently catheterized through the abdominal wall and past the nipple valve mechanism into the reservoir for waste

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elimination. The K-pouch can provide individuals with a degree of independence by allowing them to manage waste elimination discreetly and maintain control over the timing of bowel movements without the need for an ostomy appliance.

The conversion of the J-pouch to a continent ileostomy pouch represents a significant surgical procedure because it involves mobilization and preservation of the J-pouch that requires reoperative abdominopelvic surgery followed by its conversion into a K-pouch. In this article, we discuss the indications and contraindications, present the technical principles applied for the conversion, and describe the outcomes of such conversion in the literature.

INDICATIONS AND CONTRAINDICATION FOR CONVERSION

Pouch failure after an IPAA procedure is an infrequent complication that has been declining over time, with an average failure rate of 4.3% in studies published after 2000 compared to 6.8% in studies published before 2000.⁶ Causes for J-pouch failure can be functional, structural, or inflammatory. The most common cause is pelvic sepsis, which can be identified as the underlying cause in about half of patients.^{15,16} Pelvic sepsis most commonly presents as chronic fistulas, both pouch-vaginal and pouch-perineal, sinus tracts, and chronic abscesses. Chronic abscesses are mostly observed in cases in which the diagnosis is switched to Crohn's disease after pouch construction.

Functional problems are the second most common cause for failure of pelvic pouches. These can present as pouch dysfunction with urgency, incontinence, or increased (nocturnal) frequency.^{5,6,17} Sometimes, these symptoms are primarily functional, with no clear structural cause underlying them. Alternatively, structural problems, such as strictures, anastomotic stenosis, or pouch twist, can cause outlet-related dysfunction or secondary effects on the pouch, leading to functional problems with bloating, incomplete emptying, and frequent small volume of liquid stools.¹⁸ In most cases, the pouch can be salvaged by endoscopic or surgical interventions.¹⁹ However, a subgroup of patients might not respond favorably or may not be amenable to these interventions, resulting in pouch failure. Finally, in some cases, patients may develop chronic pouchitis, which can significantly impair patient's quality of life.^{20,21} Chronic pouchitis that is not manageable through conservative measures is the underlying cause of 10% of all pouch failures.¹⁵ Patients with severe, refractory cuffitis or neoplasia of the cuff or anal transitional zone may undergo J- to K-pouch conversion surgery.²²⁻²⁴ Some patients with J- or S-pouches may develop isolated perianal fistulas and abscesses with normal pouch body and prepouch ileum but are diagnosed as having Crohn's disease.²⁵ K-pouch surgery may be offered to these patients.

In some cases of J-pouch failure, conversion of the failed J-pouch to a K-pouch is a viable option. This possibility should be considered and discussed with the patient because it can offer benefits not achievable otherwise. These include preservation of bowel length of the failed pouch and improved body image and cosmesis.²⁶ In contrast, it is essential to recognize that there are certain contraindications that may make this conversion inappropriate or risky for some patients. Patients with severe underlying health conditions, such as advanced cardiovascular disease, respiratory disorders, or significant immunosuppression, may not be suitable candidates for the surgical complexity involved in converting a failed J-pouch to a K-pouch. Similarly, patients who are malnourished or in poor general health may not have the physical reserves necessary to undergo this major surgery and recover successfully. The risks associated with surgery could outweigh the potential benefits in these cases. Problems with compliance of the patient, inability to adequately reintubate, intrinsic structure problems with the pouch that necessitate pouch excision and the risk for ongoing pouchitis, and the anticipation of a high likelihood of valve slippage and hence reoperation and risk for short-bowel syndrome are other reasons to avoid a J- to K-pouch conversion.

The quality and length of the small bowel are also an important factor in this decision. The conversion from a J-pouch to a K-pouch requires a sufficient length of the remaining small bowel. In cases in which the J-pouch has been previously shortened or is inadequate because of complications, a K-pouch conversion may not be technically feasible. Patients with multiple prior abdominal surgeries can have extensive adhesions that can complicate the surgical procedure, increase the risk of injury to bowel and nearby structures, and make the conversion technically challenging or unsafe. Also, in patients with active small-bowel inflammation, conversion might not be suitable given the risk of bowel resections in the future and the patient being at risk for short-bowel syndrome. In patients who are morbidly obese, it can be challenging to fixate the K-pouch to the abdominal wall while preserving a good function of the nipple valve. Finally, technical aspects that can only be assessed intraoperatively can make the surgery itself challenging in some cases, including pouch resizing, creation of a functional continent valve, and adequate pouch fixation to prevent displacement or prolapse.

One of the key challenges for this procedure is the identification of suitable candidates. Careful patient selection is crucial to ensure optimal outcomes and minimize the risk of complications. In addition to the factors discussed above, factors such as patient's preferences, motivation, and compliance should weigh heavily when evaluating the appropriateness of undergoing a conversion procedure. Unlike the J-pouch, which allows for spontaneous bowel movements through the anus, the K-pouch requires regular catheterization to empty the reservoir. This process

involves inserting a catheter into the stoma to release stool. Although many individuals adapt well to this routine, others may find it cumbersome or inconvenient, requiring a commitment to regular maintenance and potential adjustments to their lifestyle. Therefore, decisions regarding the conversion should be made on a case-by-case basis after thorough consultation with a skilled surgical team.

TECHNIQUES

The surgical techniques used for the creation of a continent ileostomy have evolved significantly over the years.^{4,27} In recent years, a few reports have focused on the description of specific surgical techniques for the conversion from a J-pouch to a K-pouch.^{28,29} The main objective during the conversion of the J-pouch to a continent ileostomy is the creation of a sufficiently sized reservoir with a high-quality valve mechanism while preserving as much small bowel as possible. To achieve this goal, 3 distinctive principles can be applied. These are pouch rotation, nipple valve creation, and continuity restoration. The common technique includes the use of the existing J-pouch as the K-pouch reservoir, with the small bowel proximal to the pouch used to create the nipple valve and exit conduit, and continuity of the small bowel being restored to the distal end of the pouch after pouch rotation. This technique is described below. In some cases, additional techniques may be needed. We illustrate 2 other techniques that we have uniquely adapted to some specific circumstances.

Technique of J- to K-Pouch Conversion

When the existing J-pouch is in good condition and of sufficient capacity, it can be used as the reservoir for the K-pouch. However, there is no efferent limb distal to the J-pouch to serve as the nipple valve, unlike in the case of a de novo K-pouch construction. Therefore, in virtually all cases of J- to K-pouch conversion, a pouch rotation technique is needed to provide a small-bowel limb suitable for the creation of the nipple valve (Fig. 1). In this technique, the afferent limb is transected 15 cm proximal to the J-pouch and is used to create the nipple valve and exit conduit for the K-pouch. Subsequently, the pouch is rotated, and the transected proximal end of the small bowel is connected to the distal end of the former J-pouch to restore continuity. This can be performed using a hand-sewn or stapled anastomosis using a circular stapler. This principle forms the basis for preserving the pouch during this conversion.

In some circumstances, in which the J-pouch is of inadequate capacity or only a portion of it can be preserved after disconnection from the anal canal, the pouch can be augmented, provided the patient has an adequate length of the small bowel. By use of part of the proximal small bowel, the pouch can be effectively enlarged or

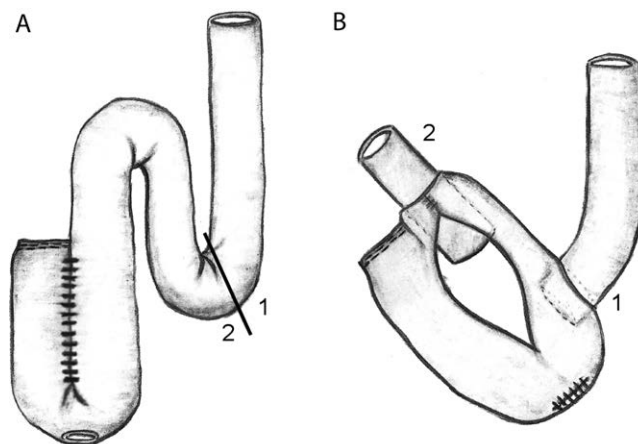


FIGURE 1. Pouch rotation during J- to K-pouch conversion. A, The afferent limb is transected 15 cm proximal to the J-pouch and is used to create the nipple valve for the K-pouch. B, The pouch is rotated and the transected proximal small bowel is connected to the distal end of the former J-pouch to restore continuity.

augmented to form a suitable K-pouch reservoir. This can be performed in at least 2 different ways. Our preferred technique is to use the small-bowel loop just proximal to the J-pouch for the augmentation (Fig. 2). The afferent small-bowel loop is positioned adjacent to the pouch, and both lumens are opened longitudinally and are sutured together to form a larger pouch. This effectively converts a J-pouch into an S-pouch (Fig. 2). Nowadays, the nipple valve can be fashioned from the small-bowel loop, that is, just proximal to this new addition to the reservoir. Alternatively, the distal part of the afferent loop is used for the nipple valve, whereas the more proximal end of the small bowel is used for augmentation and rotating the pouch simultaneously.³⁰

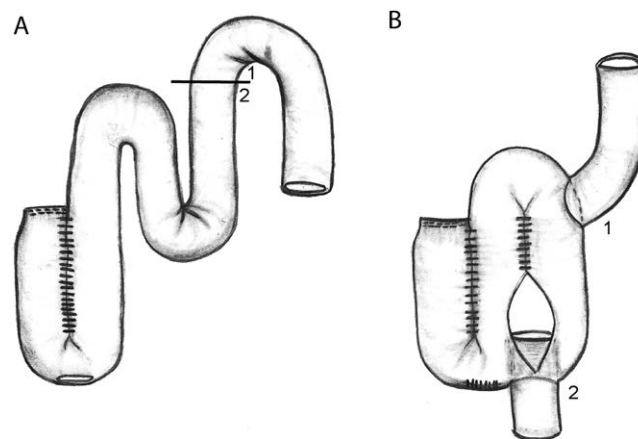


FIGURE 2. Pouch augmentation with rotation. The afferent small-bowel loop is positioned adjacent to the pouch and both lumens are opened longitudinally and sutured together to form a larger pouch (effectively turning a J-pouch into an S-pouch). The afferent limb is transected more proximally to the newly augmented pouch, and the nipple valve is fashioned from it. The pouch is then rotated and the transected proximal small bowel is connected to the distal end.

However, in certain cases, the quality of the small bowel immediately adjoining the J-pouch may preclude its use for the creation of the nipple valve/exit conduit. In this circumstance, we have occasionally used the interposition of an isolated, more proximal good-quality small-bowel segment (Fig. 3) for the creation of the nipple valve and exit conduit.

OUTCOMES OF CONVERSION

The K-pouch procedure is generally considered more technically challenging than a primary J-pouch surgery. It requires careful construction of the reservoir and the nipple valve, with slippage being a common problem. The complexity of the procedure is reflected in a high proportion of patients, in about 70% to 80%, needing some type of surgical revision.^{31,32} In a recent systematic review, our group provided an overview of complications and reported outcomes of K-pouch construction.³³

In this article, we focus on outcomes after the conversion of a J-pouch to a K-pouch. In the only comparative study, Aytac et al³⁴ compared outcomes of K-pouch creation after a failed J-pouch to patients receiving a K-pouch without prior IPAA. They performed a case-matched study including 134 patients and compared functional outcomes and long-term complications. Complication rates were similar in all categories, including the need for major revision surgery (52% vs 61%, $p = 0.756$). Equally important, Kaplan-Meier analysis showed similar continent ileostomy survival of 92% vs 94% at 1 year and 79% vs 80% in 5 years, for a K-pouch after IPAA vs naive K-pouch, respectively. Lian et al¹⁶ previously reported

outcomes of 64 patients undergoing continent ileostomy after a failed IPAA. Both of these studies were from the Cleveland Clinic, with several patients from the study by Aytac et al³⁴ included in the previous report by Lian et al¹⁶; thus, they reported similar outcomes. Börjesson et al¹² reported the outcomes of 13 patients who underwent a J- to K-pouch conversion. They reported a pouch failure rate of 2 of 13 (15%) and a revision rate of 8 of 13 (62%). These results are in line with other reports of outcomes of primary K-pouch creation.

In an interesting study by Wasmuth et al,³⁵ durabilities of J- and K-pouch were compared. The authors found that the success rate of both procedures was high and that the long-term failure rates were similar. They concluded that a continent ileostomy is not inferior to a J-pouch in terms of complications and failure and that it is a good option for patients in whom IPAA is unsuitable. Similarly, Duraes et al³⁶ reported on the outcomes of 168 patients with continent ileostomy who underwent revision surgery. They showed a pouch survival rate of 89% at 3 years and 79% at 10 years. The authors concluded that redo continent ileostomy surgery is associated with long-term pouch retention and satisfactory quality of life.³⁶

This latter point deserves additional elaboration because of its significance. In the largest study of its kind, Nessar et al² studied the quality of life of patients with a continent ileostomy compared to those with end ileostomy. They found that patients with continent ileostomy achieved significantly higher quality of life in terms of their Cleveland Global Quality of Life score than their counterparts with end ileostomy. Measurement of

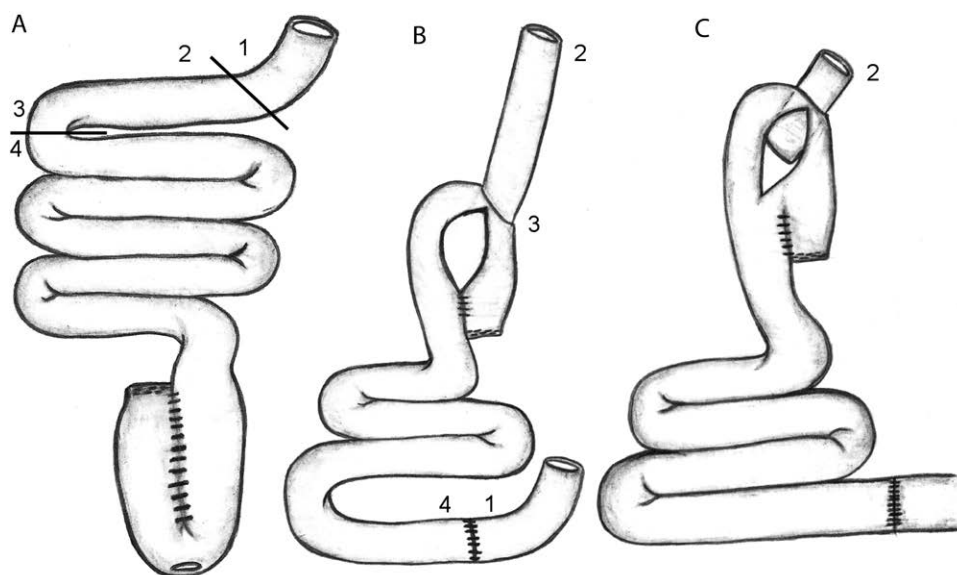


FIGURE 3. Small bowel interposition. A, When the small-bowel loops proximal to the J-pouch are unsuitable for the valve, these are skipped and left in place. A more suitable isolated segment of proximal small bowel is transected. B, The transected segment of the small bowel is then attached to the preserved J-pouch reservoir (B and C). The interposed segment is used to create the nipple valve, whereas continuity is reestablished of the 2 ends of the small bowel on either side of the segment that was isolated.

quality of health and quality of energy using a visual analog score showed similar significant results in favor of continent ileostomy. In another study, Litle et al³⁷ studied patient satisfaction in 129 patients who underwent continent ileostomy. This study showed that despite the risk of revisions, 97% of the patients who retained their continent ileostomy were very satisfied and considered their outcomes in terms of quality of life to be good or excellent.

CONCLUSIONS AND FUTURE PERSPECTIVES

The conversion of the J-pouch to a continent ileostomy represents a significant surgical procedure. When performed in centers of expertise, it can be a good option for patients who otherwise will require an end ileostomy. Indications for conversion include most cases of J-pouch failure, with a few important exceptions. The surgical principles needed to allow preservation of the J-pouch for its conversion to a K-pouch are described. The outcomes of K-pouch after conversion from a J-pouch are similar to those achieved for primary K-pouch creation, with a low failure rate and good quality of life. Although a significant proportion of patients might require revision surgery for their continent ileostomy, the long-term durability and survival rates of the K-pouch are excellent.

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