

Triple Stapling Resection and J pouch anal Stapling Anastomosis for Ulcerative Colitis

Hidejiro Kawahara (✉ kawahide@outlook.jp)

Kokuritsu Byoin Kiko Nishisaitama Chuo Byoin <https://orcid.org/0000-0002-8618-1556>

Nobuo Omura

Kokuritsu Byoin Kiko Nishisaitama Chuo Byoin

Tadashi Akiba

Tokyo Jikeikai Ika Daigaku Fuzoku Kashiwa Byoin

Technical advance

Keywords: stapling resection, stapling anastomosis, iliac pouch, ulcerative colitis, rectourethral muscle

Posted Date: August 28th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-62245/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: In 2017, we reported laparoscopic total proctocolectomy with J pouch anal anastomosis, which was created at the dentate line by our original procedure using staplers, Triple Stapling Resection and J pouch Anal Stapling Anastomosis (TSRJASA), for ulcerative colitis (UC) patients. UC patients have undergone TSRJASA since it was introduced in our institution. However, the feasibility and usefulness of TSRJASA for UC patients has not been elucidated.

Methods: From January 2014 to December 2018, fourteen patients with ulcerative colitis, including three cases of concomitant cancer, who underwent TSRJASA were enrolled in this study. Anal manometry was performed using the Pock Monitor GMMS-100 system (STAR MEDICAL, INC., Tokyo, Japan) one year and two years after surgery. Maximum resting pressure, maximum squeeze pressure, and the length of the high-pressure zone were measured. Fecal incontinence was evaluated using the Wexner incontinence questionnaire.

Results: J pouch anal anastomosis was created at the dentate line in all patients. In a manometric examination two years after surgery, maximum resting pressure was 75.3 (54-88) mmHg, maximum squeeze pressure was 125.0 (90-160) mmHg, and the length of the high-pressure zone was 39.6 (35-42) mm. Wexner score was 2.8 (1-4).

Conclusion: TSRJASA seems to be a useful procedure for UC patients given its acceptable defecation function.

Introduction

When rectal transection is attempted immediately above the anal canal with a 60-mm length linear stapler, the anterior wall of the rectum just above the anal canal cannot be transected anatomically [1]. However, after cutting the rectourethral muscle using a 30-mm length stapler, rectal transection was easily performed immediately above the anal canal using a 30-mm length stapler twice. After rectal transection immediately above the anal canal, J pouch anal stapling anastomosis was created at the dentate line because oral side of the anal canal from the dentate line was resected using a 25-mm circular stapler [2]. We reported this procedure named Triple Stapling Resection and J pouch Anal Stapling Anastomosis (TSRJASA) in 2017 [2]. However, the feasibility and usefulness of TSRJASA for patients with UC has not been elucidated.

Methods

The Ethics Committee for Biomedical Research of the Jikei Institutional Review Board approved the protocol of this study [30–164(9185)]. From January 2014 to December 2018, fourteen patients with ulcerative colitis, including three cases with concomitant cancer, who underwent TSRJASA were retrospectively enrolled in this study. Anal manometry was performed using the Pock Monitor GMMS-100 system (STAR MEDICAL, INC., Tokyo, Japan) one year and two years after surgery. Maximum resting

pressure, maximum squeeze pressure, and the length of the high-pressure zone were measured. Fecal incontinence was evaluated using the Wexner incontinence questionnaire.

Surgical Technique

After laparoscopic total mesorectal mobilization to the anal canal, rectal transection was performed at the upper edge of the anal canal by firing three sets of 30-mm long staplers (Fig. 1). If a patient is male, the purpose of the first firing is to incise the rectourethral muscle to separate the rectum and urethra (Fig. 2). After the rectal transection, J pouch anal anastomosis was performed by the double stapling technique using a 25-mm circular stapler through the anus (Fig. 3). J pouch anal anastomosis is created at dentate line because the oral side of the anal canal from the dentate line is resected by a circular stapler (Fig. 4). A temporary stoma was created in all patients and was closed 3 to 6 months postoperatively [3].

Statistical analysis

Continuous variables are expressed as the mean and range. The paired t-test was used for the comparison of continuous variables. A p-value of less than 0.05 indicated significance. All data were analyzed with IBM SPSS Statistics, version 24.0 (IBM Japan, Ltd, Tokyo, Japan).

Results

The mean age of fourteen patients, including ten males and four females, was 40.7 (19–77) years (Table 1). J pouch anal anastomosis was created at the dentate line in all patients. In a manometric examination after surgery, maximum resting pressure was 71.7 (52–85) mmHg one year after surgery and 75.3 (54–88) mmHg two years after surgery. Maximum squeeze pressure was 112.4 (87–141) mmHg one year after surgery and 125.0 (90–160) mmHg two years after surgery. The length of the high-pressure zone was 33.4 (30–35) mm one year after surgery and 39.6 (35–42) mm two years after surgery ($p < 0.001$). Wexner score was 5.0 (4–6) one year after surgery and 2.8 (1–4) two years after surgery ($p < 0.001$) (Table 2).

Discussion

Two types of ileal pouch anal anastomosis have been widely performed for UC patients worldwide. One is a handsewn technique with mucosectomy [4], and the other is a stapling technique with the retention of the mucosa of the rectal stump [5]. For the handsewn technique with mucosectomy, all colorectal mucosa is removed to avoid the risk of further inflammatory disease, dysplasia, or cancer. However, the excision of the anal transition zone is associated with postoperative problems of continence [6]. On the other hand, for the stapling technique with retention of mucosa, the surgical procedure is simple and provides better functional results compared with the handsewn technique. However, the retention of mucosa has the potential for disease recurrence or malignant degeneration [7, 8]. However, all colorectal

mucosa can be removed by triple stapling resection and stapling anastomosis in our procedure TSRJASA. Furthermore, our method provided acceptable defecation function. The measurements obtained by manometry, maximum resting pressure, maximum squeeze pressure, and the length of the high-pressure zone yielded similar results compared to reported normal values [9] at two years after surgery. Recovery of the length of the high-pressure zone seems to be significantly involved in the noted Wexner score improvements.

Conclusion

Long-term follow-up and large-scale studies are still necessary, but TSRJASA seems to be a useful procedure for UC patients.

Abbreviations

TSRJASA

Triple Stapling Resection and J pouch Anal Stapling Anastomosis; UC:ulcerative colitis

Declarations

Ethics approval and consent to participate

The Ethics Committee for Biomedical Research of the Jikei Institutional Review Board approved the protocol [30-164(9185)], and all patients or their family members provided written informed consent to participate.

Consent for publication

The written consent to publish images or other personal or clinical details of participants was obtained from the patient.

Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

The authors declare no competing interests.

Funding

None.

Authors' contributions

HK and NO performed operation. All authors analyzed and interpreted the patient data, and have been involved in drafting the manuscript. TA had given final approval of the version to be published. All authors read and approved the final manuscript.

Acknowledgements

None.

Author details

¹ Department of Surgery, Kashiwa Hospital, Jikei University School of Medicine

163-1 Kashiwashita, Kashiwashi, Chiba 277-8567, Japan.

² Department of Surgery, Nishisaitama-chuo national Hospital, 2-1671 Wakasa, Tokorozawashi, Saitama 359-1151, Japan.

References

1. Choi JS, Potenti F, Wexner SD, Nam YS, Hwang YH, Nogueras JJ, Weiss EG, Pikarsky AJ. Functional outcomes in patients with mucosal ulcerative colitis after ileal pouch-anal anastomosis by the double stapling technique: is there a relation to tissue type? *Dis Colon Rectum*. 2000 Oct;43(10):1398–404.
2. Kawahara H, Akiba T, Yanaga K. Cuff-less J Pouch Anal Stapling Anastomosis for Ulcerative Colitis. *Anticancer Res* 2017 Oct. 2017;37(10):5743–5.
3. Kawahara H, Hiramoto Y, Takeda M, Matsumoto N, Misawa T, Yanaga K. Anthropometric Assessment After Proctocolectomy Due to Ulcerative Colitis. *In Vivo*. 2019 Jan-Feb;33(1):239–243.
4. Parks AG, Nicholls RJ. Proctocolectomy without ileostomy for ulcerative colitis. *Br Med J*. 1978;2:85–8.
5. Heald RJ, Allen DR. Stapled ileo-anal anastomosis: a technique to avoid mucosal proctectomy in the ileal pouch operation. *Br J Surg*. 1986;73:571–2.
6. Saigusa N, Kurahashi T, Nakamura T, Sugimura H, Baba S, Konno H, Nakamura S. Functional outcome of stapled ileal pouch-anal canal anastomosis versus handsewn pouch-anal anastomosis. *Surg Today*. 2000;30:575–81.
7. Silvestri MT, Hurst RD, Rubin MA, Michelassi F, Fichera A. Chronic inflammatory changes in the anal transition zone after stapled ileal pouch-anal anastomosis: is mucosectomy a superior alternative? *Surgery* 2008; 144: 533–537; discussion 533–537.
8. Lovegrove RE, Constantinides VA, Heriot AG, Athanasiou T, Darzi A, Remzi FH, Nicholls RJ, Fazio VW, Tekkis PP. A comparison of hand-sewn versus stapled ileal pouch anal anastomosis (IPAA) following proctocolectomy: a metaanalysis of 4183 patients. *Ann Surg*. 2006;244:18–26.

9. Frenckner B, Euler CV. Influence of pudendal block on the function of the anal sphincters. Gut. 1975 Jun;16(6):482-9.

Tables

Please see the supplementary files section to view the tables.

Figures

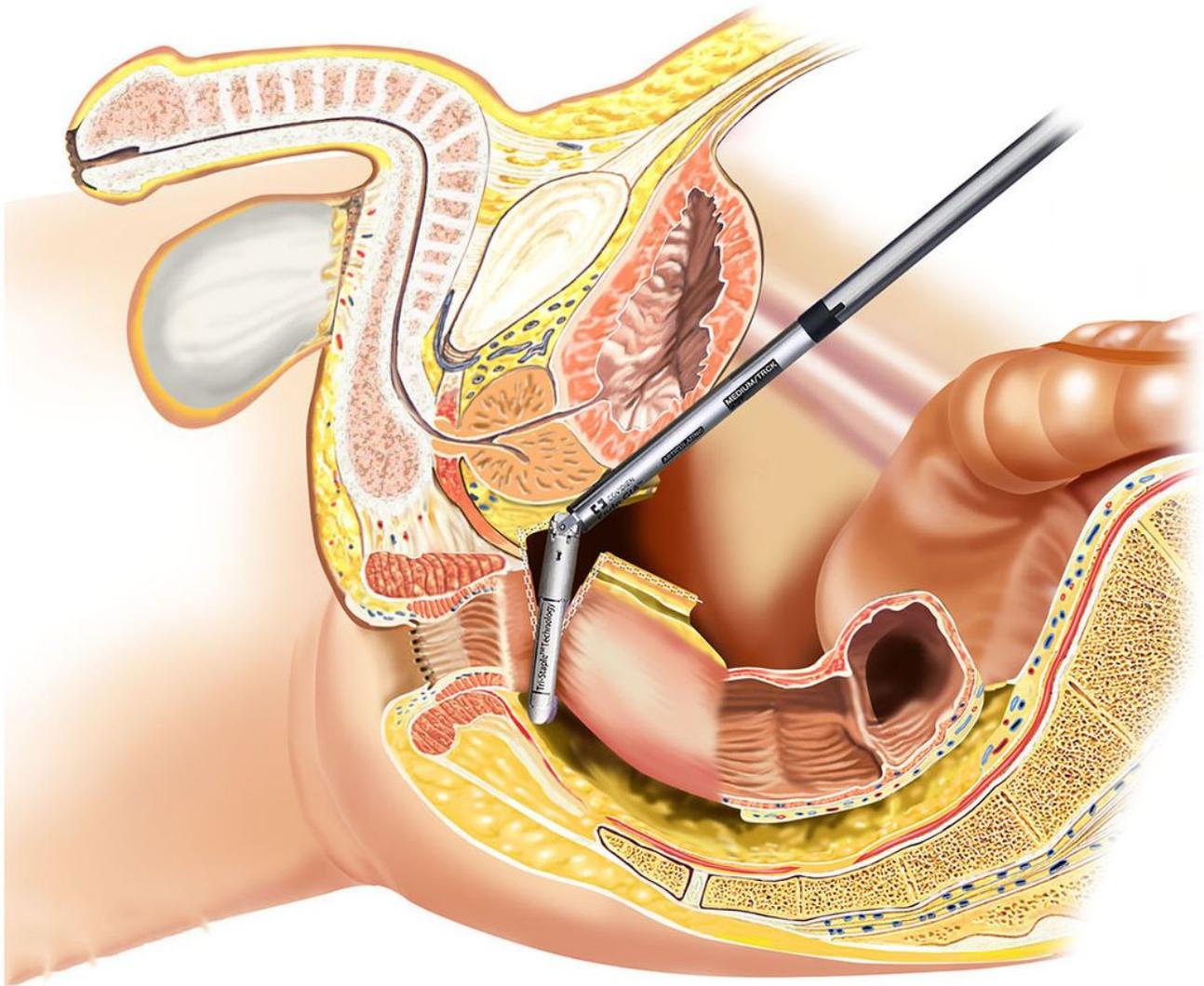


Figure 1

Schema of rectal transection by stapler Rectal transection is performed at the upper edge of the anal canal by firing three sets of 30mm-long staplers.

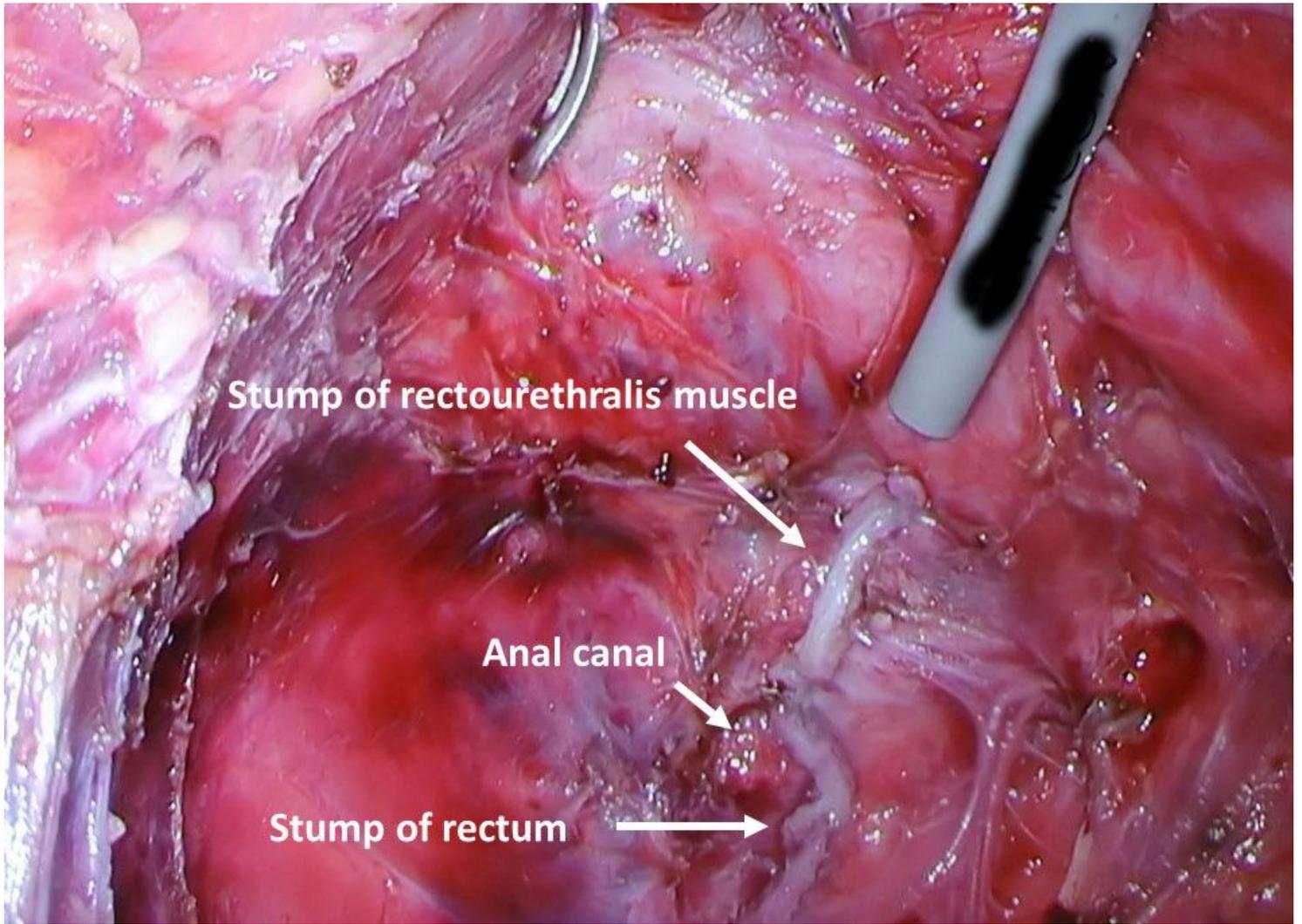


Figure 2

View of rectal transection The stump of rectourethral muscle is shown closely abdominal side of the rectal stump in the anal canal.

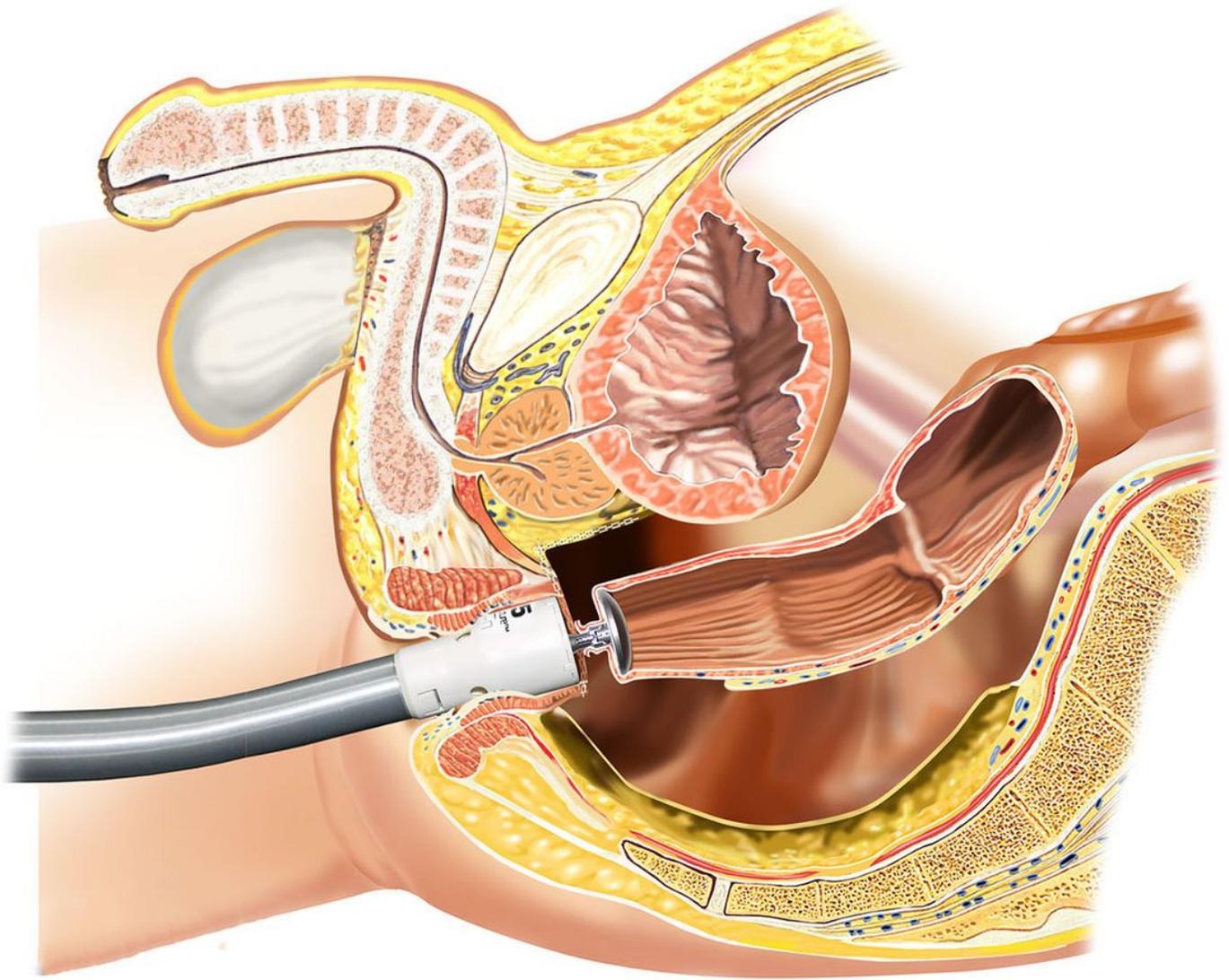


Figure 3

Schema of J pouch anal anastomosis by a circular stapler J pouch anal anastomosis is performed by the double stapling technique using a 25-mm circular stapler through the anus.

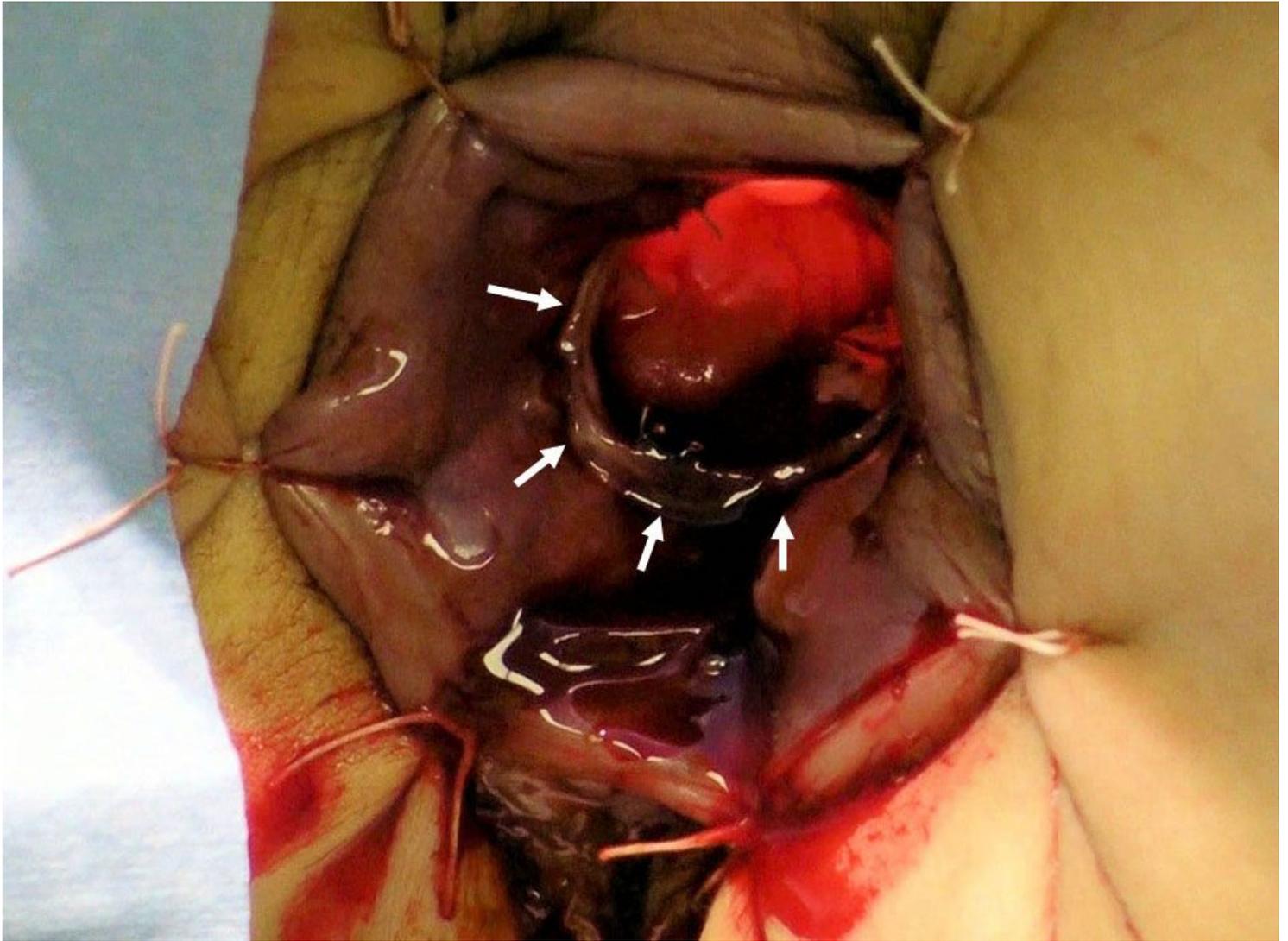


Figure 4

View of J pouch anal anastomosis An anastomosis which is pointed out white arrows is created at the dentate line.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tables3SR2.xlsx](#)
- [Tables3SR1.xlsx](#)