

Standardized Technique of Laparoscopic Extralevator Abdominoperineal Excision (LAP-ELAPE)

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(Purpose) Extralevator abdominoperineal excision (ELAPE) for low rectal cancer has been accepted to decrease the rate of circumferential resection margin (CRM) and intra-operative perforation. However cylindrical abdominoperineal excision require intraoperative postural change, and plastic procedure for the large perineal defect. We present our laparoscopic technique for extralevator APE (LAP-ELAPE) and short-term outcomes.

(Background) In case of low rectal cancer that require abdominoperineal excision, mesorectal dissection may cause inadvertent bowel perforation and/or CRM involvement. In order to decrease the rate of CRM involvement, ELAPE achieving cylindrical specimen has been reported by Holm et al (Br J Surg. (2007) 94:232-8). In this procedure, the mesorectal mobilization is stopped at the upper border of the coccyx posteriorly, just below the autonomic nerves laterally and anteriorly just below the vesicles in men or just below the cervix uteri in women. The patient is then turned into the prone jack-knife position, the levator muscles is exposed all around the circumference before entering the pelvis. The levator muscles are divided along the lateral margin on both sides, from posterior to anterior with coccyx (Fig.1-A).The specimen is gently brought out and dissected off the prostate or the posterior vaginal wall.

Fig. 1 Landmarks of the LAP-ELAPE cadaveric model (male)

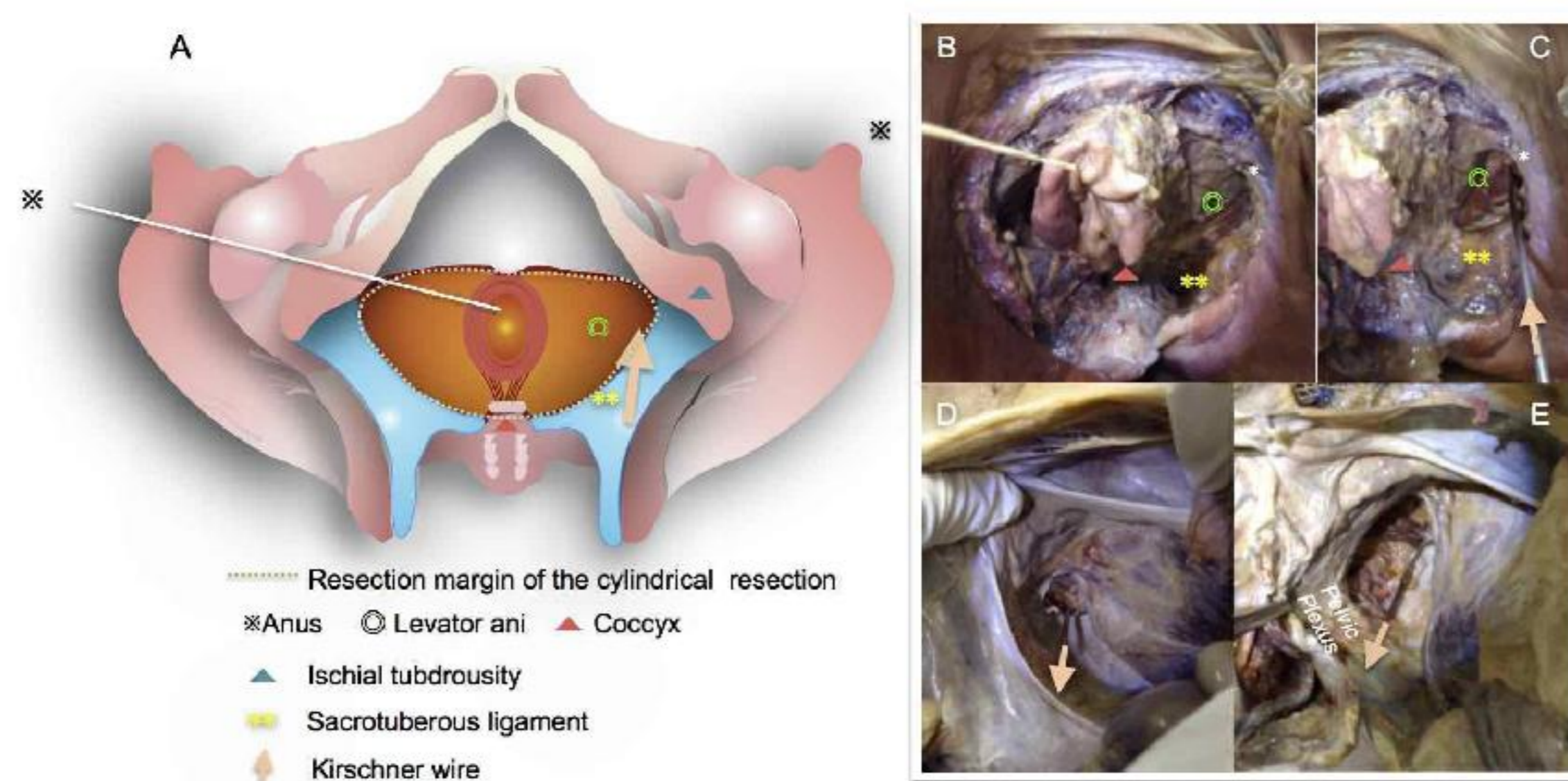
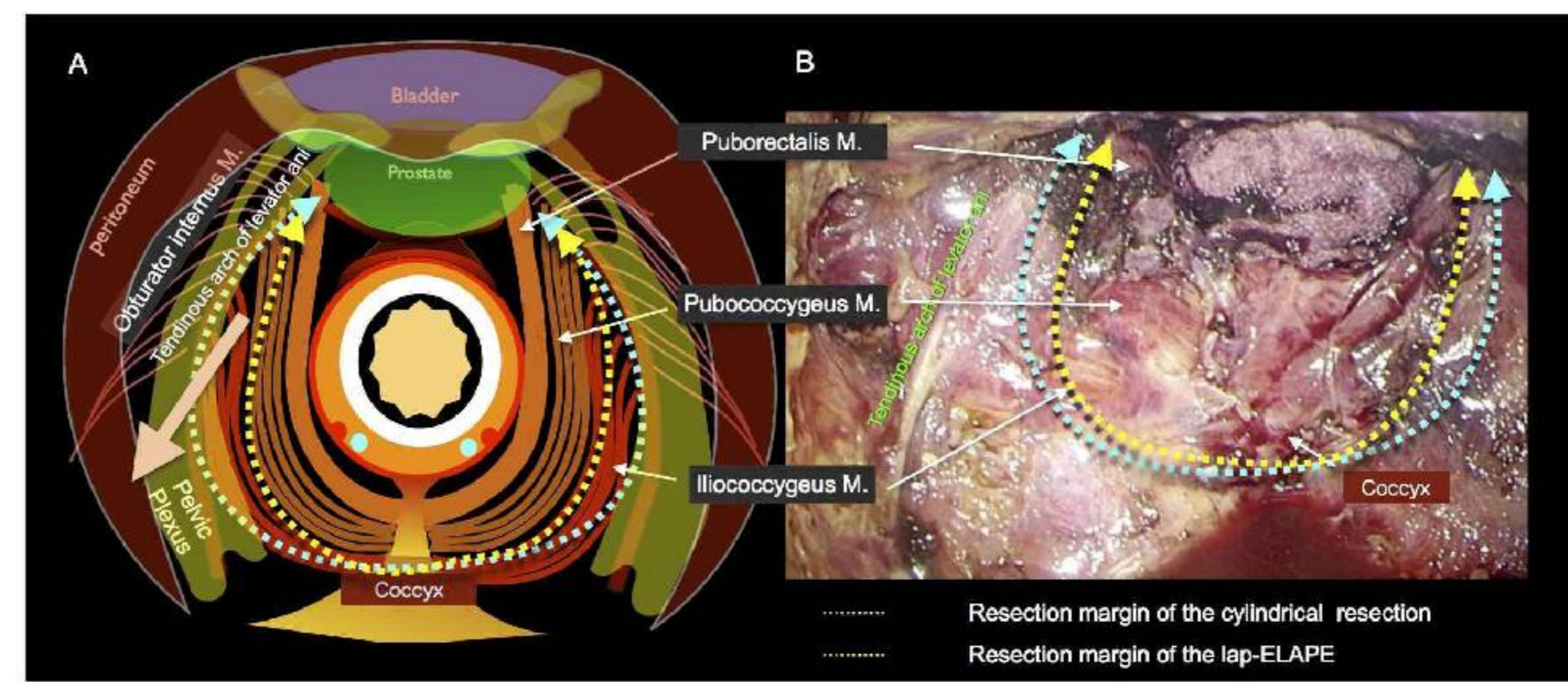


Fig. 2 Landmarks of the LAP-ELAPE surgical anatomy (Male)



(LAP-ELAPE) However, achieving specimen without CRM involvement dose not always require intraoperative postural change. The cadaveric model indicates the entire surface of levator muscles (right side) before entering the pelvis (Fig.1-B). A point of lateral margin of the levator muscle is stuck with a Kirschner wire from the perineal side (Fig.1-C). From the abdominal side, outer margin of the cylindrical resection can be confirmed by the point of Kirschner wire penetration (Fig.1-D). After exposing the pelvic plexus, tendinous arch of levator ani is confirmed that is the outer margin of the cylindrical resection (Fig.1-E).As the laparoscopic view provides the precise anatomical landmarks in the pelvic cavity, resection margin for getting the cylindrical specimen can be identified from the abdominal side without postural change (Fig. 2-A). Furthermore, conventional cylindrical resection dose not always be required for the curative resection without CRM involvement (Fig. 2-B, 3, 4). According to the preoperative MRI T2 weighted images, resection line of the LAP-ELAPE can be determined from the abdominal side (Fig. 2-3). Semi cylindrical specimen can be obtained avoiding bottle neck specimen without CRM involvement using our procedure (Fig. 5). Fig.4: A, B, C: rt. side, D, E: lt. side, F: posterior side, of the resection line of the LAP-ELAPE.

Fig. 3

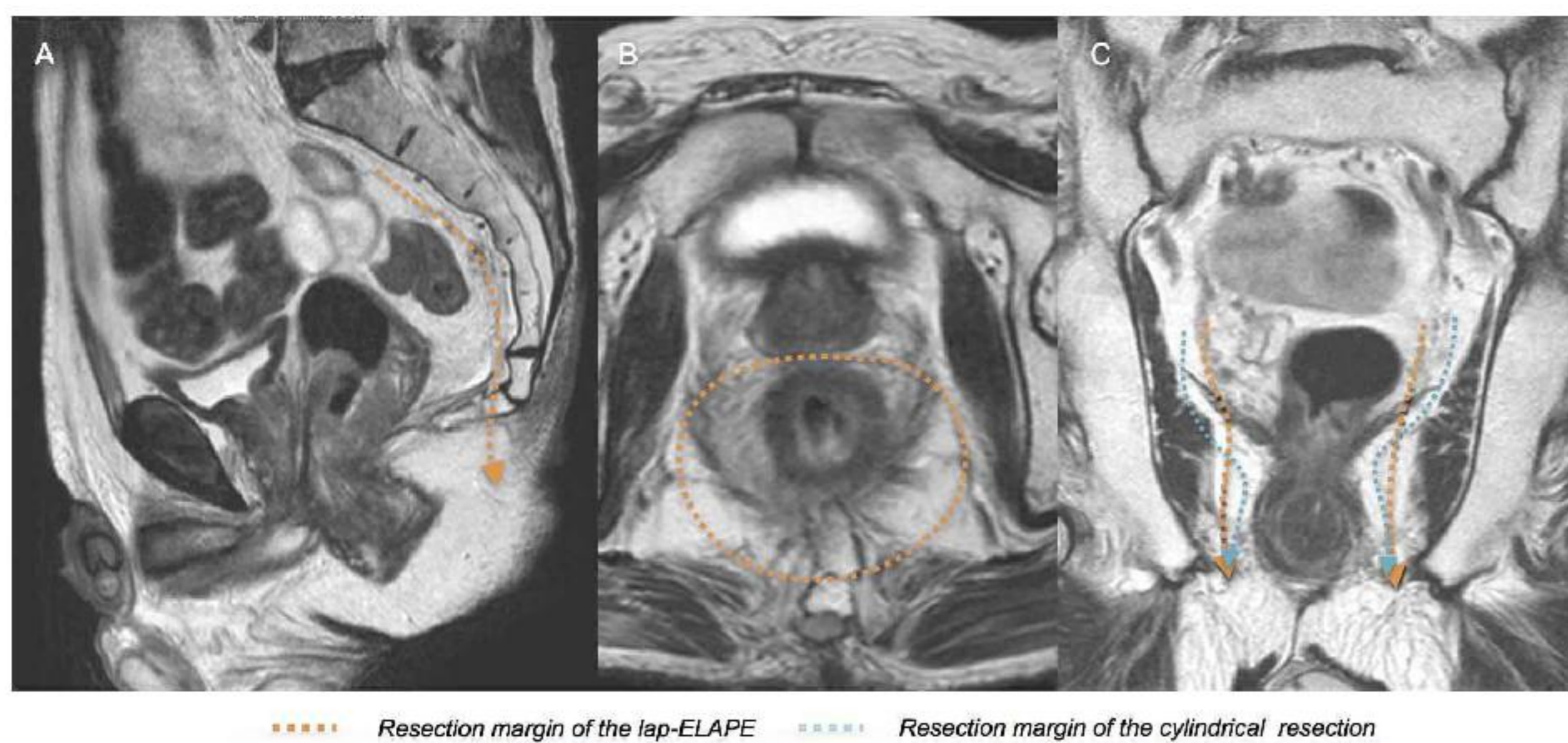
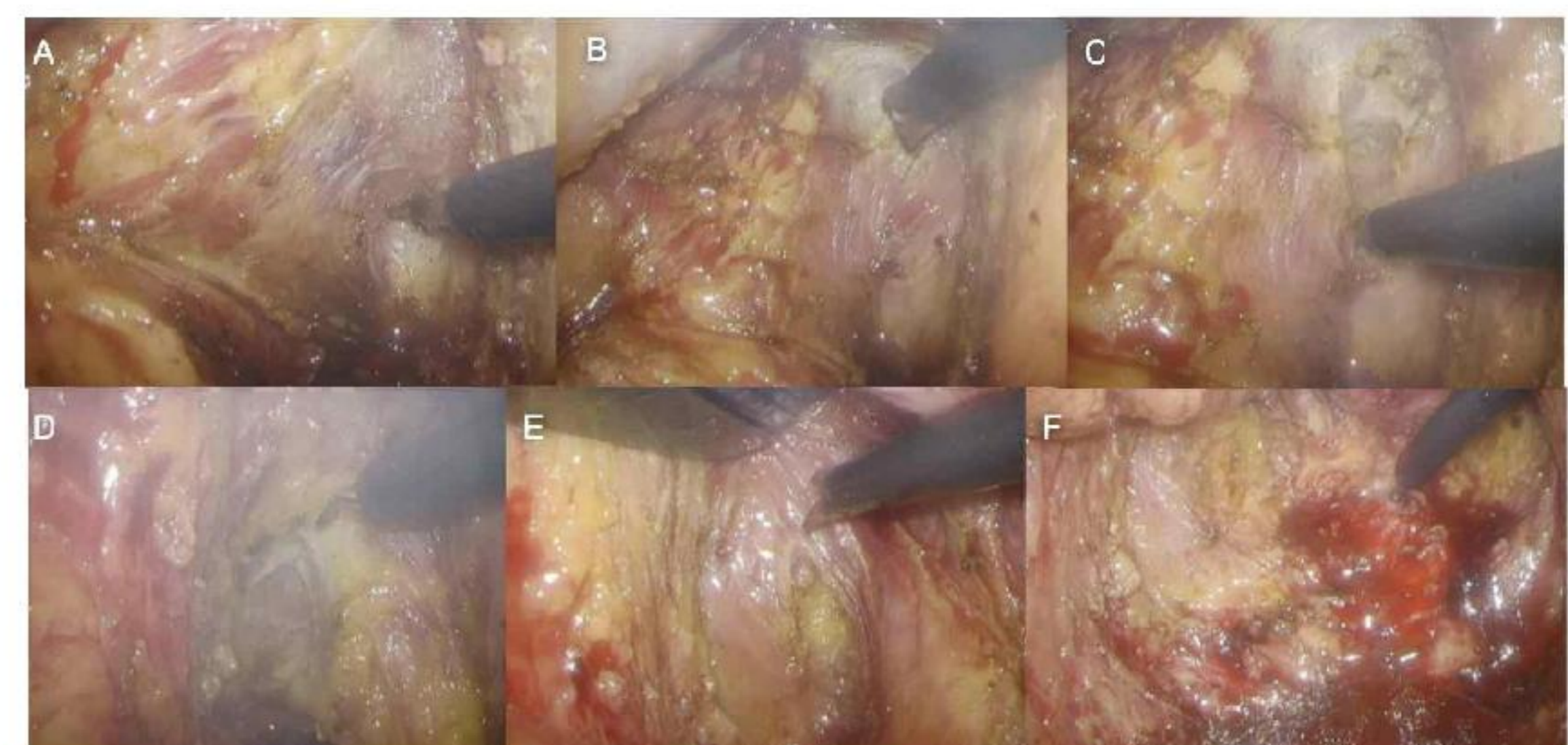


Fig. 4



(Results) A series of 30 patients underwent curative APR between 2008 and 2015, with 16 receiving neoadjuvant chemo (radio) therapy (NAC(RT)). One patient underwent lateral node dissection. Male female ratio was 21:9. BMI was 20.8 (14.2-27.9). Pathological T was Tx:3, T2:13, T3:10, T4b:4. Duration of surgery and blood loss were 283 (195-462) min, 62 (0-440) ml. There was no mortality. No case encountered intra-operative accident and mean postoperative hospital stay was 15 (10-29) days. 52 cases were pCRM negative (pCRM 1 mm ≤) and 5 cases were positive (pCRM 1 mm >). After a median follow-up of 37 months (8-68 months), 9 cases experienced recurrence (lung:5, liver:2, brain :1, lateral lymph node:3, unknow:1). No case experienced presacral recurrence. Four cases have died of Cancer. One case experienced perineal hernia radiologically.

Fig. 5

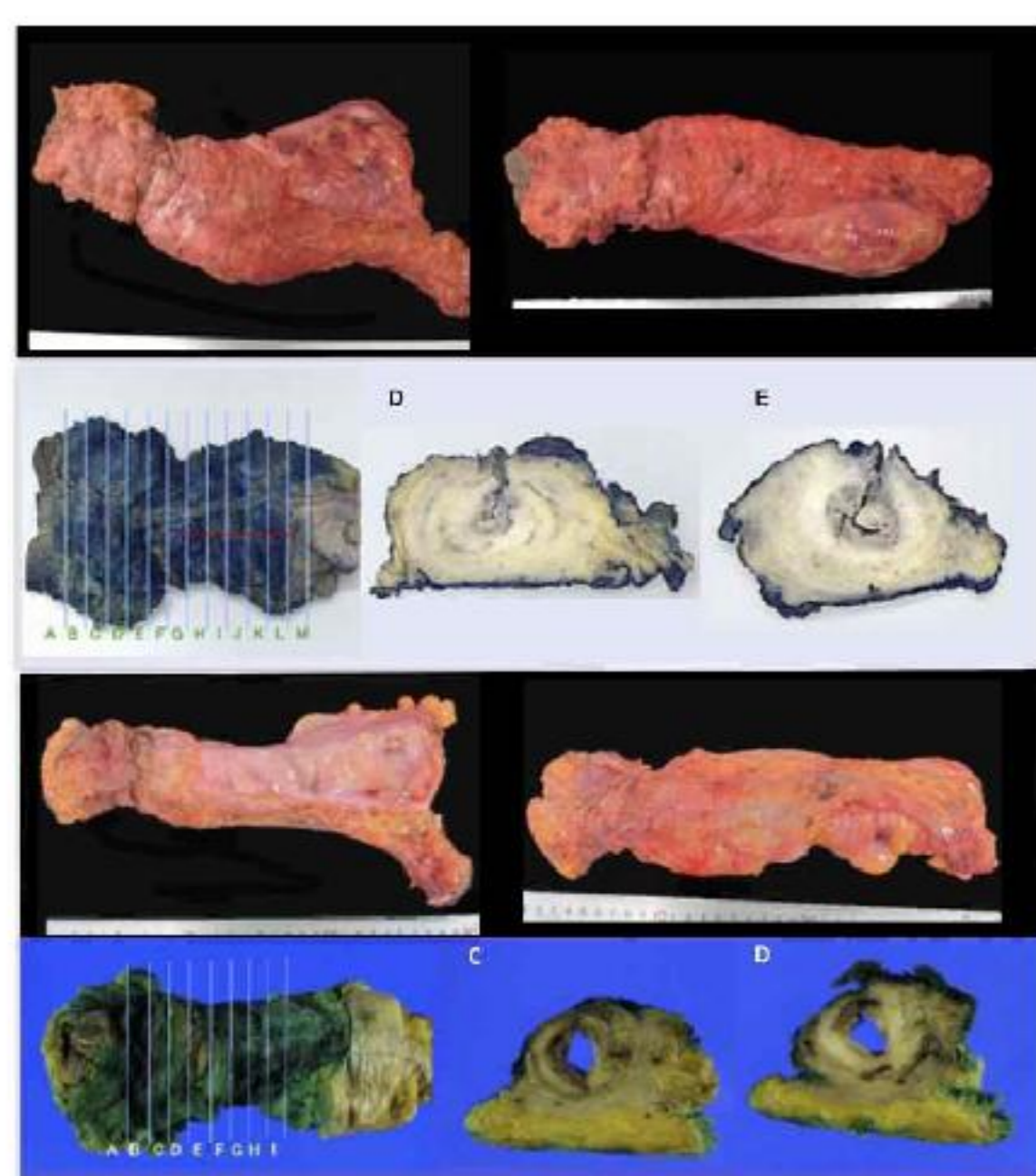
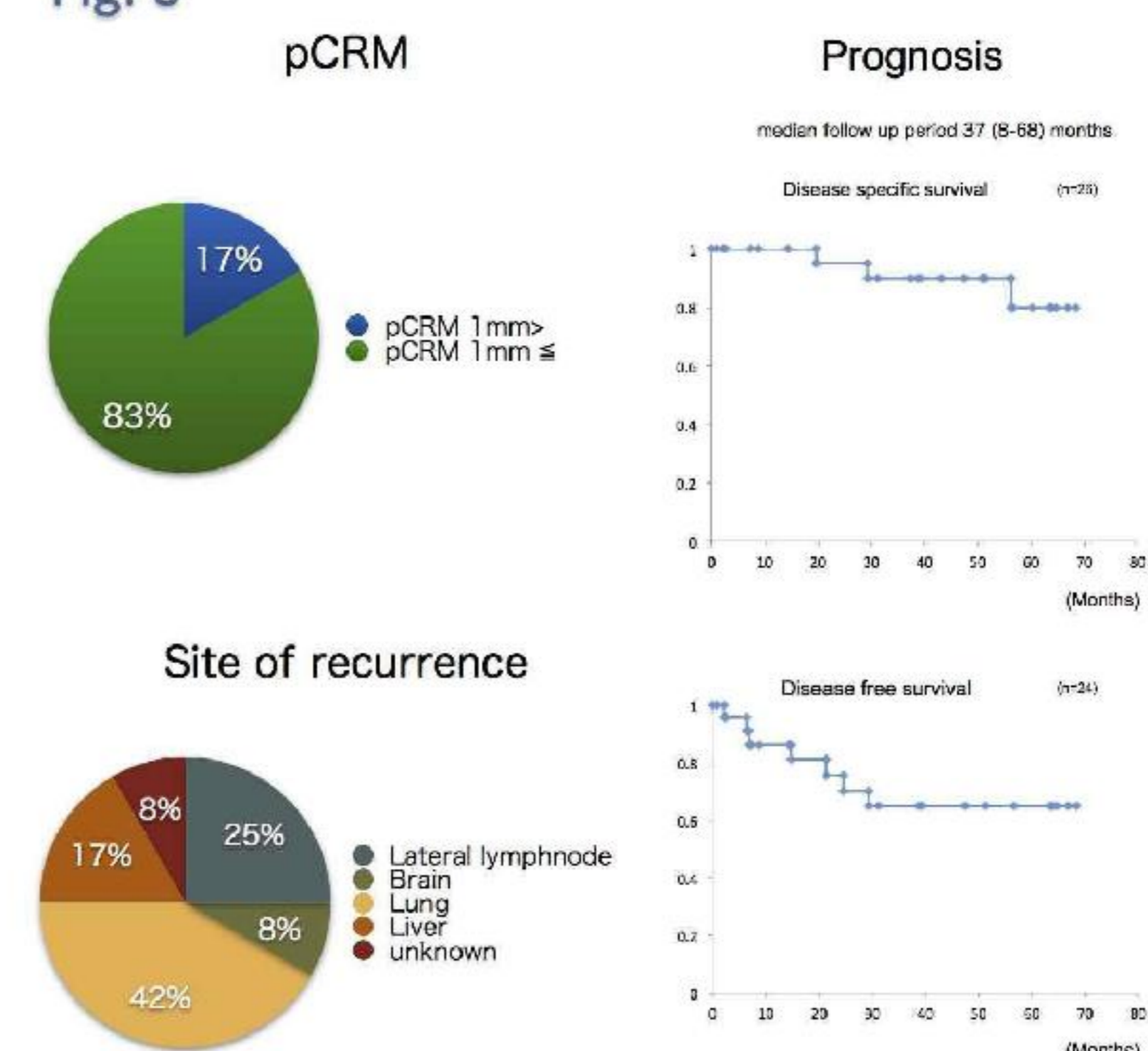


Table. 1

Patients Characteristics (2008.2-2015.5)

n	30
Age	67 (39-89)
Male/female	21/9
BMI	20.8 (14.2-27.9)
Preoperative chemo-radiotherapy	16 (Chemotherapy 1, RT 1)
Lateral lymph node dissection	1
Tumor size (mm)	43 (0-80)
(y) pT	Tx:3, T2:13, T3:10, T4b: 4
(y) pStage	I:11, IIA: 8, IIC:3, IIIA:1, IIIB:2, IIIC:1, IVA:1, X:3
Duration of surgery (min)	283 (178-462)
Blood loss (ml)	62 (0-440)
Postoperative hospital stay (days)	15 (10-29)
Postoperative complications (Clavien-Dindo Grade III<)	IIIA:1 stoma necrosis

Fig. 6



(Conclusion) As laparoscopic procedure provides the anatomical landmarks for levator transection without CRM involvement in the deep pelvic cavity, LAP-ELAPE can be standardized.

