Case Report

Laparoscopic En Bloc Partial Cystectomy in Urachal Adenocarcinoma: Initial Experience in Rajavithi Hospital

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Background: *Urachal carcinoma (UrC) is a rare malignancy of the bladder which is most often treated by open laparotomy partial cystectomy with or without pelvic lymph node dissection. Recently, laparoscopic surgical techniques have been developing in many countries, and a number of research papers have shared their experience of laparoscopic management of UrC.*

Case Report: *A 44-year-old Thai male patient presented at the Division of Urology, Rajavithi Hospital, in September 2010 having experienced gross hematuria for the previous two months. Cystoscopy and computed tomography (CT) scan of whole abdomen showed an intraluminal protruding mass centered in the bladder wall. After transurethral resection with Biopsy, pathologic results revealed adenocarcinoma of the bladder. The patient was diagnosed as having UrC and was designated a candidate for laparoscopic en bloc partial cystectomy.*

Results: *The operative time was 3 hours, estimated blood loss was 50 ml., there were no complications, and the Foley catheter was removed after the tenth day. Post-operative pathologic reports of UrC and free margin showed no tumor recurrence after follow-up cystoscopy every 3 months, and annual CT scan of whole abdomen for two years.*

Conclusion: *This single-case report describes laparoscopic en bloc partial cystectomy in a case of small urachal carcinoma; however, long-term follow-up in a larger population series is needed to finally determine the role of laparoscopy in treating this disease.*

Keywords: *Urachus, Urachal cancer, Urachal adrenocarcinoma, Laparoscopic partial cystectomyn*

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The urachus is an embryologic remnant of the allantois and corresponds to the median umbilical ligament in adults. Urachal Carcinoma (UrC) is a rare malignancy of the bladder and histologically is most often an adenocarcinoma. Surgical treatment for UrC most commonly involves radical cystectomy or open en bloc partial cystectomy with or without pelvic lymph node dissection. Recently, Laparoscopic surgical techniques in the field of urology have been significantly developing in many countries, and a large number of researchers[1-16] have shared their experiences of laparoscopic management of UrC. The present report presents the technical aspects and experience of Laparoscopic En Bloc Partial Cystectomy in Urachal Adenocarcinoma in Rajavithi Hospital

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Case Report

A 44-year-old Thai male patient who had been experiencing gross hematuria for the previous two months presented at the Division of Urology, Rajavithi Hospital in September 2010. Cystoscopy and computed tomography (CT) scan of whole abdomen showed an intraluminal protruding mass centered in the bladder wall as shown in Fig. 1, 2. After TUR-Biopsy, pathologic results revealed adenocarcinoma of the bladder. The patient was diagnosed with UrC and proposed as a candidate for laparoscopic en bloc partial cystectomy.

Technical considerations

The pathologic results of this patient who presented with hematuria showed adenocarcinoma. Cystoscopy was performed to ensure availability of a clear margin for resection and to inspect the bladder for associated multifocality. Preoperative CT scan of the abdomen was performed and clearly delineated a lesion at the dome with involvement of the full thickness of the bladder wall (Fig. 1). No evidence of pelvic

lymphadenectomy or distant metastatic disease was found. After preoperative evaluation, and urachal carcinoma was diagnosed, and en bloc partial cystectomy of the dome was performed.

Patient preparation and positioning, and port placement

Patient preparation was done under general anesthesia and in the Trendelenberg position, and port site positioning was performed as shown in Fig. 3. The supra-umbilical port was inserted by open technique, and the other ports were placed under laparoscopic vision. The author used two 12 mm ports for the supra-umbilical and mid-position between the supra-umbilical port and the anterior superior iliac spine (ASIS). Another 5 mm port was positioned at mid position between the supra-umbilical port and ASIS.

Fig. 1 CT scan whole abdomen showing infiltrative mass at anterior wall and dome of bladder, size 4x4.6x 3.5 cm. No evidence of pelvic lymphadenectomy or distant metastatic disease was found.

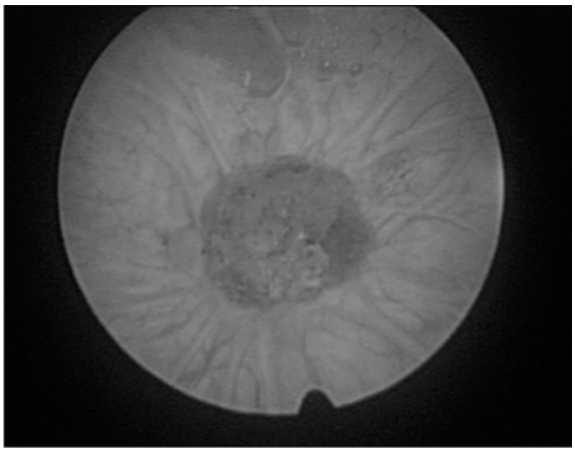

Fig. 2 Cystoscopy result showing bladder mass at anterior wall of bladder diameter 3 cm.

Anatomical resection limits

The anatomic boundaries of resection (Fig. 4) included resection of the tumor, with macro-scopically normal bladder margins forming the distal limit. Extensive resection was performed of the peritoneum lateral to both medial umbilical ligaments, which defined the lateral limits, the posterior sheath of the rectus muscle of the abdomen to the arcuate line, the muscle fibers of the rectus muscle below it, and the extraperitoneal fat in the space of Retzius as the anterior limit together with the urachus up to the umbilicus superiorly as far as the umbilical skin.

Identification and dissection

After identifying the median umbilical ligament and urachal mass, the author started incision to the peritoneum laterally to the medial umbilical ligament on

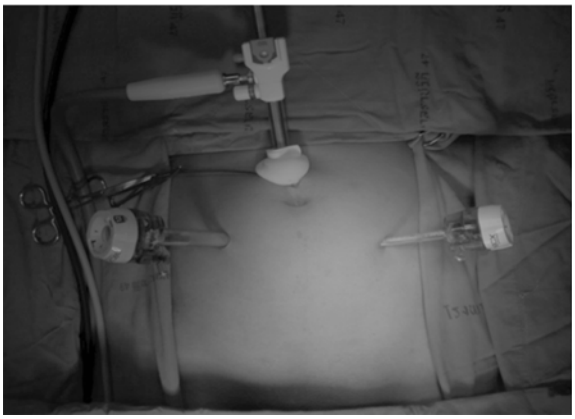

Fig. 3 Performance of port site positioning.

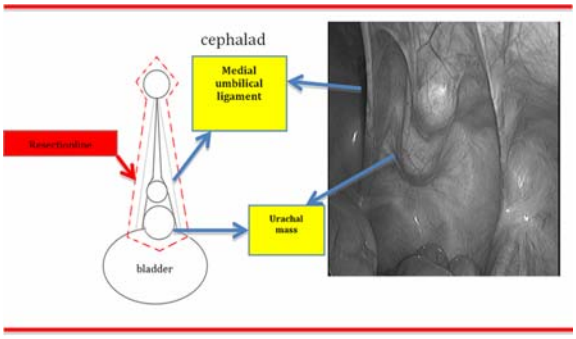

Fig. 4 Anatomic resection limit.

both sites and dissected into the Retzius space, the two incisions meeting in the midline at the level of the umbilicus. The urachus was then disconnected from the undersurface of the anterior abdominal wall to allow dissection of the entire urachus with the overlying peritoneum in a plane between the posterior rectus sheath and the undersurface of the muscle belly of the rectus muscle, as shown in Fig. 5a and 5b. The anterior wall of the bladder was mobilized to the level of the prostatovesical junction in order to allow subsequent tension-free reconstruction.

Partial cystectomy

The border of the urachal mass was identified and incision was commenced at the bladder about 1 cm from the tumor margin using monopolar electrical scissors. After incision of bladder was made, the tumor margin inside the bladder was identified, and partial cystectomy was performed with 1cm margin. Before completing the partial cystectomy, a bag was placed at the lateral side to House the specimen. After completing the partial cystectomy, the specimen was pushed into the bag immediately to prevent tumor contamination, and it was entrapped in the specimen bag as shown in Fig. 5c, 5d, 6a and 6b, after which the specimen bag was closed and suspend with the median umbilical ligament.

Umbilectomy

The supra-umbilical port was removed and the suture of the specimen bag was pulled. A skin incision was made around the umbilicus and hanging specimen bag to dissect en bloc along median umbilical ligament as shown in Fig. 6c.

Closure of bladder

After completing the en bloc partial cystectomy, the author partially closed the abdomen and pushed the camera port to the intra-corporeal suture to close the bladder wall by continuing suturing, starting at each side to midline, and joining together with an intra-corporeal knot (as shown in Fig. 6d). A Foley catheter was inserted before the last stitches were closed. Leakage was tested by normal saline infusion of 100 cc, and a Radivac drain was inserted through the 5mm port.

Abdomen and skin closure

The abdomen was closed using Vicryl No. 0 and the skin was closed with Monocryl 4/0 subcuticular stitches as shown in Fig. 7.

Pathology (Fig. 8)

Gross specimen

The urachus consisted of a portion of umbilicus including median umbilical ligament. The umbilicus measured 2.5x1.2x1 cm, and the cut surface was gray brown while the median umbilical ligament

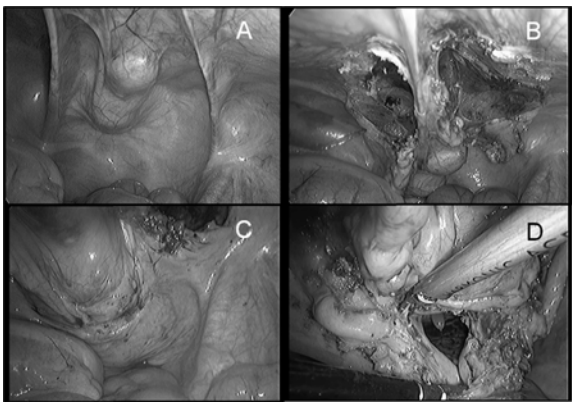

Fig. 5 Two urachal masses identified in both medial umbilical ligaments; A) Incision of peritoneum lateral to medial umbilical ligament; B) Incision to bladder wall 1cm from tumor margin; C) Bladder wall incision to mucosal layer showing tumor margin from the inside view of the bladder; D).

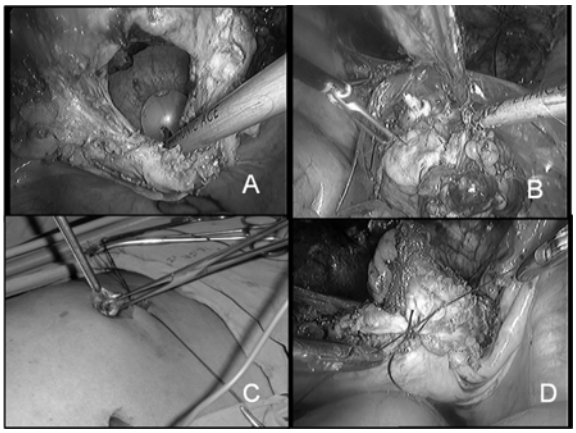

Fig. 6 Circumferential incision of tumor margin; A) specimen pushed into the specimen bag and closure of the opening of the specimen bag; B) Umbilectomy by made skin incision around the umbilicus, dissecting around the umbilicus until umbilectomy completed, and dissection along median umbilical ligament to complete en bloc partial cystectomy; C) suture on each side joined together in midline by intra-corporeal knot; D).

measured 8 cm in length. The distal part revealed a previously-cut mucinous yellow brown rubbery mass measuring 6.5x5x2.5 cm.(Fig. 8a).

Microscopic pathology result

The umbilicus was negative for malignancy, as was the median umbilical ligament. The urachal mass had a poorly differentiated adenocarcinoma with signet ring cell, and the surgical margins were free (Fig. 8b).

Post-operative results

The operative time was 3 hours, and estimated blood loss was 50 cc. Post-operative pain score was grade 2 (2 doses of analgesic injections were administered, and the post-operative ambulation date was the first post-operative day). The Radivac drain was removed on the fourth post-operative day. On the tenth day postoperativey, a cystogram revealed that the patient had no urine leakage as shown in Fig. 9a, and the Foley catheter was removed on the same day. No complications were observed.

Post-operative follow-up

Post-operative follow-up 1 and 3 months and two years post-operatively revealed good healing of the surgical wound.

Cystoscopy 1 month and three months post-operatively showed good healing of mucosa at the dome of the bladder, and no tumor recurrence was evident, as shown in Fig. 9b.

CT scan of whole abdomen two years post-post-operatively revealed no recurrence of tumour at the antero-superior wall of the urinary bladder, and no bilateral iliac or perivesical nodes, as shown in Fig. 9c.

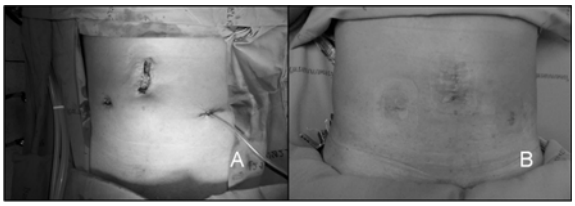

Fig. 7 Insertion of drain through the 5 mm port and closure of abdomen by subcuticular stitches; A) post-operative surgical scar; B).

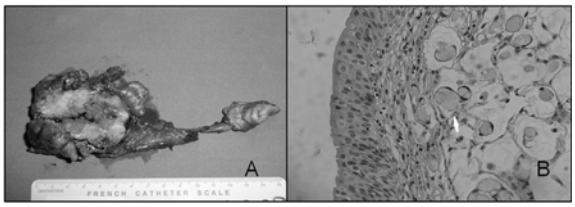

Fig. 8 Gross pathologic results showing umbilicus, median umbilical ligament and urachal tumor; A), Microscopic pathologic result displaying poorly differentiated adenocarcinoma with signet ring cell (arrow mark) and mass protrusion in the normal bladder mucosa to the bladder cavity; B).

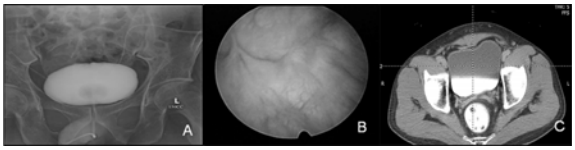

Fig. 9 Post-operative follow-up Cystogram at day10 showing no leakage of contrast media; A), Cystoscopy 1st and 3rd months after surgery; B), CT scan whole abdomen at 2 years post-operatively; C).

Discussion

Primary adenocarcinoma accounts for less than 1% of malignant bladder tumors[1]. Adeno-carcinoma of the urinary bladder is categorized into two groups, of either urachal or non-urachal origin, in accordance with strict clinical and pathologic criteria. Previous studies have suggested several criteria for making a diagnosis of urachal carcinoma: first, its location in the bladder dome or anterior wall; second, absence of cystitis glandularis, cystitis cystica or intestinal metaplasia in the urothelium; third, presence of urachal remnants; fourth, invasion of muscle with either intact or ulcerated epithelium; fifth, sharp demarcation between tumor and urothelium; and sixth, extension into the space of Retzius[2-5].

The traditional surgical options for treating urachal carcinoma have been either an open radical cystectomy or the more recently-accepted extended partial cystectomy and umbilectomy. Early diagnosis of a contained urachal tumor favors complete extended partial cystectomy including umbilectomy by wide surgical excision which has shown a good prognosis[6,7]. Some authors have shown that there is no difference in the 5-year survival rates of patients treated with partial cystectomy and radical cystectomy[8,9]. Others have demonstrated that is a difference in cancer-specific mortality between treatment with umbilectomy and non-umbilectomy[6] in that the non-umbilectomy group have higher recurrence rates, while there have been studies that have shown that there is no difference in cancer-specific mortality rates of patients treated with pelvic lymphadenectomy and those undergoing non- pelvic

lymphadenectomy[6].

Many recent studies have demonstrated the progress in laparoscopic urologic surgery techniques together with the favourable outcome of its treatment; for example, laparoscopic adrenalectomy, laparoscopic radical prostatectomy, and laparoscopic radical cystectomy. The laparoscopic approach for treating benign urachal anomalies has also been reported to be safe and efficacious[10-13]. Laparoscopic partial cystectomy has been described in treatment of a variety of benign diseases of the bladder, mostly addressing the treatment of vesical endometriosis[13], bladder pheochromocytoma[14], and bladder leiomyoma[15]. Moinzadeh et al[16], in discussing their experience with laparoscopic partial cystectomy for urachal pathologic findings, described successfully treating 2 cases of urachal adenocarcinoma with a disease-free follow-up of 1 year. They did not, however, perform pelvic lymphadenectomy as part of the procedure[16].

In the present study, the author describes his experience and surgical techniques in using laparoscopic en bloc partial cystectomy in urachal adenocarcinoma. The author performed the procedure with 3 port sites, and en bloc partial cystectomy with umbilectomy. The magnified clear view of the tumor allowed an adequate tumor-free margin, which was confirmed by histologic examination. Although the author had only a limited follow-up period of two years to ascertain the efficacy of treating these laparoscopic procedures, he believes that the procedure can be developed and used to treat urachal carcinoma.

Conclusion

This case report described the use of laparoscopic en bloc partial cystectomy in treating small urachal carcinoma. However, research with long-term follow-up in a larger population series is needed to finally determine the role of laparoscopy in treating this disease.

Acknowledgements

The author wishes to extend his thanks to the team of the Minimally-Invasive Surgery-Urology unit at Rajavithi Hospital who helped to achieve success in this operation.

What is already known on this topic?

Previous reports have described operations with techniques using more than three trocars. In the present study, the author describes his experience and surgical techniques in laparoscopic en bloc partial cystectomy for urachal adenocarcinoma.

What this study adds?

The author performed the operation with 3 port sites, and en bloc partial cystectomy with umbilectomy. The author believes that the procedure in this technique can be performed to treat small urachal carcinomas and could become the standard treatment when more data is available regarding long term outcomes. In cases of large urachal cancer, open radical surgery should be recommended because of the invasive cancer stage and the small residual capacity of the bladder.

Potential conflicts of interest

None.

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