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Research Article

Urachal Remnants: Management By Laparoscopic Approach: Case Series

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Abstract: The urachus is an embryological remnant of allantois and get almost completely fused shortly after birth & when failed to get obliterated result in spectrum of diseases. Open surgery remains treatment of choice but after the first laparoscopic excision of urachal remnant trends is changed. Laparoscopic approach is safe and effective procedure. The Settings and Design in this study is we performed laparoscopic excision in GA using 3 ports technique. Dissection of urachal remnant done using harmonic cautery. All patients were discharged with foley's catheter in-situ and catheter was removed on 5 to 7 post-operative days after confirming no leak from bladder dome and was followed up to 3 months. The Methods and Materials were in this study Between March 2014 and April 2015, 4 consecutive patients, 2 women, and 2 men with mean age group of 36.5 years presented to outpatient department with symptomatic urachal remnants. Investigated with imaging and treated by a course of oral antibiotics. All patients were followed by laparoscopic excision of urachal remnants. The Statistical analysis used is that Mean for age. In results the mean age was 36.5 years. The operative time range from 41 – 51 min with mean operative time was 46.75 min. Mean hospital stay was 2.25 days and mean day on which foley's catheter was removed post-operatively was 5.5 days. No recurrence or complication was observed during 3 months follow-up. In conclusion we conclude that urachal remnant can be excised via laparoscopic approach which is a safe and effective procedure
Keywords: Urachal remnant, Rare, Laparoscopic excision, Safe.

INTRODUCTION

The urachus is fibrous cord like vestigial structure lies between the peritoneum and the transversalis fascia. It is an embryological remnant of allantois, primarily communicates from apex of the bladder i.e. vertex vesicae to the umbilicus. During the gestational period of embryo when it's around 10mm in length urachus start to get obliterated and get almost completely fused around 16 mm embryo length. Also get separated from the umbilicus and shortly after birth get completely obliterated to become median umbilical ligament [1]. When urachus failed to get obliterated completely or at different positions result in spectrum of diseases like urachal cyst, sinus, diverticulum or patent urachus. These diseases are rare because most of them remain asymptomatic and only manifested when get infected. Urachal cyst being the most common with occurrence of 1 in 5000 birth [1, 2]. Urachal remnants only treated when get infected and become symptomatic. Surgical intervention is recommended over just drainage of abscess with antibiotic therapy due to high chances of recurrence and malignant changes in remnants. The old approaches to urachal remnant and its related complication is open surgery via a hypo gastric transverse or midline infra umblical incision. Open surgery remains treatment of choice but along with its morbidity and longer convalescence [3, 4]. but after the first laparoscopic excision of urachal remnant by Neufang *et al.;* in 1992 [5] trends is changed. Laparoscopic approach has its all advantages of any laparoscopic surgery plus it's reported as safe and effective procedure. Herein, we report our experience with complete laparoscopic removal of symptomatic urachal remnants without cuff of bladder tissue with minimally invasive surgical approach.

MATERIAL AND METHODS

Between March 2014 and April 2015, 4 consecutive patients, 2 were woman and 2 were men with mean age group of 36.5 years presented to

outpatient department with symptomatic urachal remnants. All of them presented with recurrent peri umbilical pain with or without fever and discharge. One male patient has developed cellulitis around umbilical region. All were investigated with imaging methods that is ultrasonography, CT abdomen and MRI and treated by a course of oral antibiotics according to discharge culture sensitivity except male patient treated with i.v. antibiotics in view of cellulitis. All patients were followed by laparoscopic excision of urachal remnants using same surgical technique 4 to 6 weeks later after subsiding of infection. All 4 patients were followed up to 3 to 6 months post-operatively for any recurrence.

Surgical technique

We performed laparoscopic excision under General anaesthesia after taking informed consent. All 4 patients were given a single dose of intravenous antibiotic (Cefazolin 1g) 30 min before the procedure. Patients were placed in supine position and Foley's catheterization was done prior to surgery. Surgeon stands on the left side of the patient. Pneumo peritoneum was established with a verses needle. Three ports were used, one 10 mm camera port in left hypochondrium at pamer's point and two 5 mm ports, one in the left anterior axillary line at the level of the umbilicus and the second midway between the left mid-clavicular line and anterior axillary line at the level of left Mc Burney's point, both placed under vision. A 30^{o} angled 10 mm telescope was used. After confirming the intra operative diagnosis, complete dissection of urachal remnant starting from the umbilicus to dome of bladder was done using harmonic cautery which was aided by retrograde filling of urinary bladder through foley's catheter for better visualisation of the dome of urinary bladder. The umbilical end of urachal remnant was transacted using harmonic cautery and caudal end of remnant was double ligated with chromic catgut loop and cut near the dome of bladder without damaging it. After confirming the haemostasis, the specimen was delivered with a laparoscopic retrieval bag through the 10 mm trocar site, using 5 mm 30^{0} angled lens camera. The specimen was sent for histo-pathological examination. After evacuating the pneumo peritoneum, port sites were closed in layers and sterile dressing was done. Umbilicus cleaned and dressed with antibiotic impregnated gauze for 3 days. All patients were discharged with foley's catheter in-situ and catheter was removed on 5 to 7 post-operative days after confirming no leak from bladder dome by retrograde cystography and all 4 patients were followed up to 3 months.

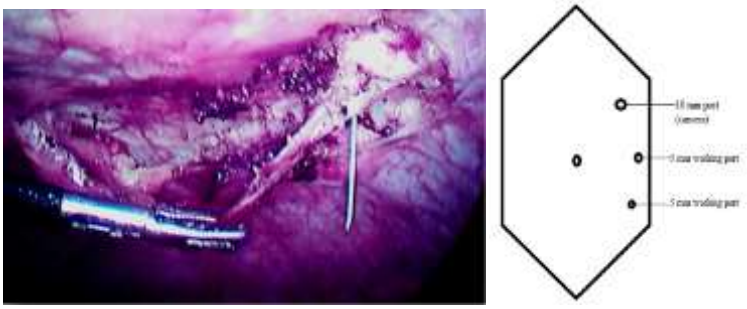

Fig-1: Laparoscopic view of urachal tract excision. Schematic view of Port Placement

Table1: Results of the study

S.No	Age	Sex	Symptom's (in months)	Imaging Study	Diagnosis	Operative time (in min)	Hospital Stay (in Days)	Histopathological Diagnosis	Complication	Days of Foley's catheter removed
1	46	F	Purulent Discharge 12 month	CT Abdomen	Urachal Cyst	45	2	Urachal Cyst	No	5
2	38	M	Discharge, Pain 2 month	CT Abdomen	Urachal Cyst	53	3	Urachal Cyst	No	5
3	28	F	Purulent Discharge 5 month	MRI Abdomen	Urachal sinus	41	2	Urachal Cyst	No	7
4	34	M	Purulent Discharge 8 month	CT Abdomen	Urachal Cyst	48	2	Urachal Cyst	No	5

RESULTS

In this reported study, 4 patients were included, 2 male and 2 female. Age group ranged from 28 – 46years and the mean age was 36.5 years. Most common presenting symptom was recurrent purulent discharge from umbilicus. All patients underwent either contrast enhanced CT abdomen or MRI abdomen to confirm the diagnosis pre-operatively and were treated by laparoscopic complete excision of urachal remnants. The operative time range from 41 – 51 min with mean operative time was 46.75 min. Mean hospital stay was 2.25 days and mean day on which foley's catheter was removed post-operatively was 5.5 days. Histo-pathological reports were reviewed. No recurrence or complication was observed during 3 months follow-up.

DISCUSSION

The urachus is a vestigial structure lies within extra peritoneal fat between the peritoneum and the fascia transversalis extending cranially to the umbilicus and arises from anterior bladder wall due to separation of the allantois from the ventral cloaca in mid trimester [6, 7]. In adult it is present as medial umbilical ligament which is a remnant of fetal umbilical arteries. Around day 16^{th} of fetus allantois appears and gets obliterated with the descent of urinary bladder. As the fetus grows in cranio caudal length urachus becomes fibrous cord like extending from apex of bladder to the navel with variable length of 3 to 10 cm and 8 to 10 mm in diameter [1]. Urachal remnants anomaly usually occurs in early childhood with reported incidence of 2% only and 2:1 male to female ratio makes it an uncommon etiology [8, 9]. Urachal remnant anomaly can be divided into two categories depending upon it pathology: congenital and acquired [2]. Congenital anomalies are more common and usually presents as a persistence urinary discharge from umbilicus. Cause may be either patent urachus or undescended bladder with male to female ratio of 3:1 and with an incidence of 1:300000 in infants and 1:5000 in adults. The acquired anomaly occurs when already obliterated urachus reopens due to some pathological factors. Various spectrums of urachal remnants diseases occurs like cyst, diverticulum, sinus or patent. These all are rare and usually asymptomatic and detected due to recurrent infection in children's [1, 2, 10]. Due to desquamation and degeneration of urachal epithelium urachal cyst forms which can get infected due to connection between urachus and bladder making a path for bacteria to ascend [11]. Most common bacteria found in infected urachal sinus are Staphylococcus, E.coli, Pseudomonas, Streptococcus, and Pseudomonas aeruginosa [12]. There is also chances of malignancy adenocarcinoma is the most common and usually found at the apex of bladder [13]. Infected urachal cyst may rupture into abdominal cavity leads to abdominal sepsis or may rupture into abdominal wall result in necrotizing fasciitis in children's [14-16]. Patient's presents with fever, abdominal pain and palpable abdominal mass and may mimic acute abdomen. Urachal cyst must be suspected in patients with micturation disorder with sterile urine. There are cases in literature where infected urachal sinus is mistaken as acute appendicitis, ovarian tumor or meckels Diverticulum [17]. A patient with chronic history, clinical examination and ultrasound is the most effective way of diagnosing an urachal cyst or abscess [18]. CT and/MRI scan should be done in adult patients with suspicious of urachal anomalies due to high risk of malignancy up to 25% which increases with age. Also there are increase chances of metastasis with age therefore early surgical treatment are inevitable [19, 20]. Midline, cystic, extra peritoneal swelling located between the umbilicus and the bladder are the diagnostic findings of a urachal cyst which can be delineated with the help of sonography [18]. Pyourachus can be more effectively detected by abdominal tomography or MRI appears as a mass conical shape with peripheral inflammatory changes in the surrounding tissue located deep to the rectus abdominis between umbilicus and bladder [21]. Bladder patency can be checked by retrograde cystography [22].

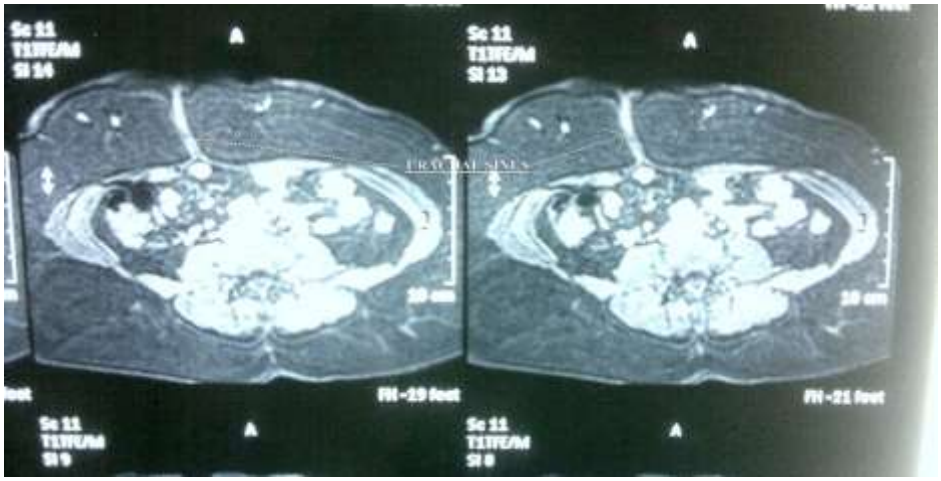

Fig-2: CECT Abdomen showing urachal anomaly

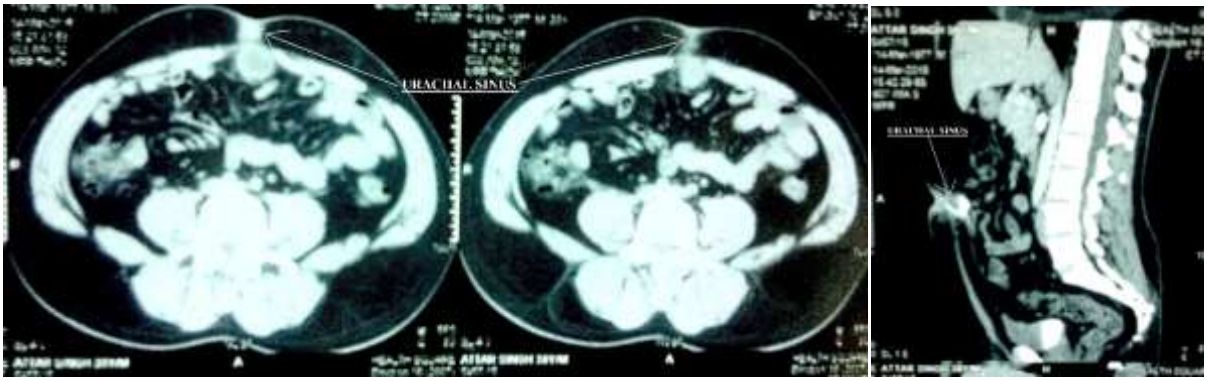

Fig-3: MRI abdomen showing urachal anomaly

Initially treatment started with a course of antibiotics followed by surgical treatment that is excision of tract [23]. A 25% to 38% of recurrence rate has been reported in cases managed conservatively by antibiotics and drainage only therefore surgical intervention is mandatory [23]. Surgical excision depends upon the patency of tract either communicating with bladder or not. For the non-communicating variety simple tract excision starting from umbilical toward bladder through extra peritoneal approach is enough. Every element of urachal remnant should be removed to avoid any recurrence or chance of malignancy [24, 25]. For the communicating variety cuff of bladder is also removed along with foley's catheter placement [26, 27, 28]. The studies have reported that laparoscopy excision of the urachal remnant to be a safe and effective procedure over open surgeries with additional advantages of less analgesic requirement and early recovery [26, 27]. Neufang *et al.;* reported the first laparoscopic excision of urachal remnant in 1992 [5]. Since then, laparoscopic surgery has been reported to be effective and safe procedure. There are two short series one in four adults [28] and one in four children [29] managing urachal remnants with laparoscopic approach showing this technique to be safe and effective with minimal morbidity. In our series we have operated four patients with clinical features of urachal cyst confirmed with diagnostic imaging using a same technique and by same surgical team. We did not seen any recurrence in any of our four patient during the follow up period which is same result shown by other series using laparoscopic approaches [30-35].The small number of patients and lack of studies comparing the two techniques open and laparoscopic are the limitation of this series.

Fig-4: Patient Abdomen picture in follow up period

CONCLUSION

In the end we conclude that urachal remnant anomaly is rare and should be removed completely due to chances of recurrence and malignancy. A traditionally open surgical technique was performed but in era of laparoscopic urachal remnant can be excised via minimal access approach which is a safe and effective procedure with its all advantages of laparoscopic surgery.

REFERENCES

1. Moore KL; The developing human: clinically oriented embryology. 2nd ed. Philadelphia: WB Saunders Company 1977; 307-9.
2. Berman SM, Tolia BM, Laor E, Reid RE, Schweizerh of SP, Freed SZ; Urachal remnants in adults. Urology 1988; 31:17-21.
3. Castillo OA, Vitagliano G, Olivares R, Sanchez-Salas R; Complete excision of urachal cyst by laparoscopic means: a new approach to an uncommon disorder. Arch Esp Urol 2007; 60: 607-11.
4. Gopalan A, Sharp DS, Fine SW, Tickoo SK, Herr HW, Reuter VE, *et al.;* Urachal carcinoma: a clinico pathologic analysis of 24 cases with outcome correlation. Am J Surg Pathol 2009; 33:659-68.

5. Neufang T, Ludtke FE, Lepsien G; Laparoscopic excision of an urachal fistula-new therapy for rare disorder. Minim Invasive Ther 1992; 1:245-9.
6. Bauer SB, Retik AB; Urachal anomalies and related umbilical disorders. Urol Clin North Am 1978; 5:195-211.
7. Scheye T, Vanneuville G, Amara B, Francannet P, Dechelotte P, Campagne D; Anatomic basis of pathology of the urachus. Surg Radiol Anat 1994; 16:135-41.
8. Nix J, Menville J, Albert M, Wendt D; Congenital patent urachus. J. Urology 1972; 107:668.
9. Mesrobia HO, Zacharias A, Balcom A, Cohen R; Ten years' experience with isolated urachal anomalies in children. The Journal of Urology 1997; 158: 1316.
10. Yiee JH, Garcia N, Baker LA, Barber R, Snodgrass WT, Wilcox DT; A diagnostic algorithm for urachal anomalies. J Pediatr Urol 2007; 3:500-4.
11. Macneily AE, Koleilat N, Kiriuluta HG, Homsy YL; "Urachal abscesses: protean manifestations, their recognition and management". Urology 1992; 40(6): 530-535.
12. Suita S, Nagasaki A. Urachal remnants. Seminars in Pediatric Surgery 1996; 5(2):107-115.
13. Dandekar NP, Dalal AV, Tongaonkar HB, Kamat MR; Adenocarcinoma of the bladder. European J. of Surg. Oncology 1997; 23(2):157-160.
14. Iuchtman M, Rahav S, Zer M, Mogilner J, Siplovich L; "Management of urachal anomalies in children and adults. Urology" 1993; 42(4): 426-430.
15. Horgan Pg, Johnson S, Courtney D; "Intra peritoneal rupture of infected urachus". BJU Int 1994; 73: 216.
16. O´Connor J, Biyani C, Austin O M, Browning AJ; "Necrotizing fasciitis: a rare complication of an infected urachal remnant in adults". J. Urol. 2003; 170(3): 920-921.
17. Blichert-Toft M, Nielsen O; "Congenital patent urachus and acquired variants". Act. Chir. Scand 1971; 137: 807.
18. Holten I, Lomas F, Mouratidis B, Malecky G, Simpson E; he ultrasonic diagnosis of urachal abnormalities. Australasian Radiology 1996; 40:2-5.
19. Ashley RA, Inman BA, Routh JC, Rohlinger AL, Husmann DA, Kramer SA; Urachal anomalies: a longitudinal study of urachal remnants in children and adults. J Urol 2007; 178:1615-8.
20. Kim DK, Lee JW, Park SY, Kim YT, Park HY, Lee TY. Initial experience with robotic-assisted laparoscopic partial cystectomy in urachal diseases. Korean J Urol 2010; 51:318-22.
21. Herman TE, Shackelford GD; Pyourachus: CT manifestations. Journal of Computer Assisted Tomography 1995; 19:440-3.
22. Mailleux P, Tancredi, MH, Neza S, Lefebvre Y, Coppens JP, Coulier B et al.; Infected urachal cyst. J. Belge de Radiologie 1993; 76(1): 20-21.
23. Ward TT, Saltzman E, Chiang S; Infected urachal remnants in the adult: case report and review. Clinical infectious diseases 1993; 16: 26-9.
24. Goldman I, Caldamene A, Gaudrer M, Hampel N, Wesselhoeft C, Elder J; Infected urachal cysts: a review often cases. J. Urology 1988; 140: 375-8.
25. Blichert-Toft M, Nielson O; Diseases of the urachus stimulating intra-abdominal disorders. American Journal of Surgery 1971; 112:123.
26. Stone NN, Garden RJ, Weber H. Laparoscopic excision of an urachal cyst. Urology 1995; 45: 161-4.
27. Siegel J, Winfield H, Valderrama E, Smith A; Laparoscopic excision of a urachal cyst. J. of Urology 1994; 151:1631-3.
28. Cadeddu JA, Boyle KE, Fabrizio MD, Schulam PG, Kavoussi LR; Laparoscopic management of urachal cysts in adulthood. J Urol2000; 164:1526-8.
29. Khurana S, Borzi PA; Laparoscopic management of complicated urachal disease in children. J Urol 2002; 168:1526-8.
30. Sun J, Zhu YJ, Shi CR, Zhao HT, He R, Liu GH; Laparoscopic radical excision of urachal remnants with recurrent infection in infants. J Endourol 2010; 24:1329-32.
31. Cutting CW, Hindley RG, Poulsen J; Laparoscopic management of complicated urachal remnants. BJU Int 2005; 96:1417-21.
32. Araki M, Saika T, Araki D, Kobayashi Y, Uehara S, Watanabe T, *et al.;* Laparoscopic management of complicated urachal remnants in adults. World J Urol 2012; 30:647-50.
33. Jung BJ, Seo JM, Lee SK, Park KH; Urachal anomalies in children: a proper approach and treatment based on the recent ten-year experience. Korean J Urol 2006; 47:651-5.
34. Okegawa T, Odagane A, Nutahara K, Higashihara E; Laparoscopic management of urachal remnants in adulthood. Int J Urol 2006; 13:1466-9.
35. Turial S, Hueckstaedt T, Schier F, Fahlenkamp D; Laparoscopic treatment of urachal remnants in children. J Urol 2007; 177: 1864-6.