



Laparoscopic percutaneous closure of patent processus vaginalis without hydrocelectomy for childhood primary hydrocele

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Introduction

- The traditional hydrocele repair: open repair with an inguinal incision, high ligating of the PPV, and hydrocelectomy, which can be total or partial (fenestration)
- Laparoscopic surgery (LS) is increasingly used in the treatment of PPV disorders in children, but mainly in the treatment of inguinal hernia.
- The use of LS in the treatment of hydrocele is still limited.

Aim

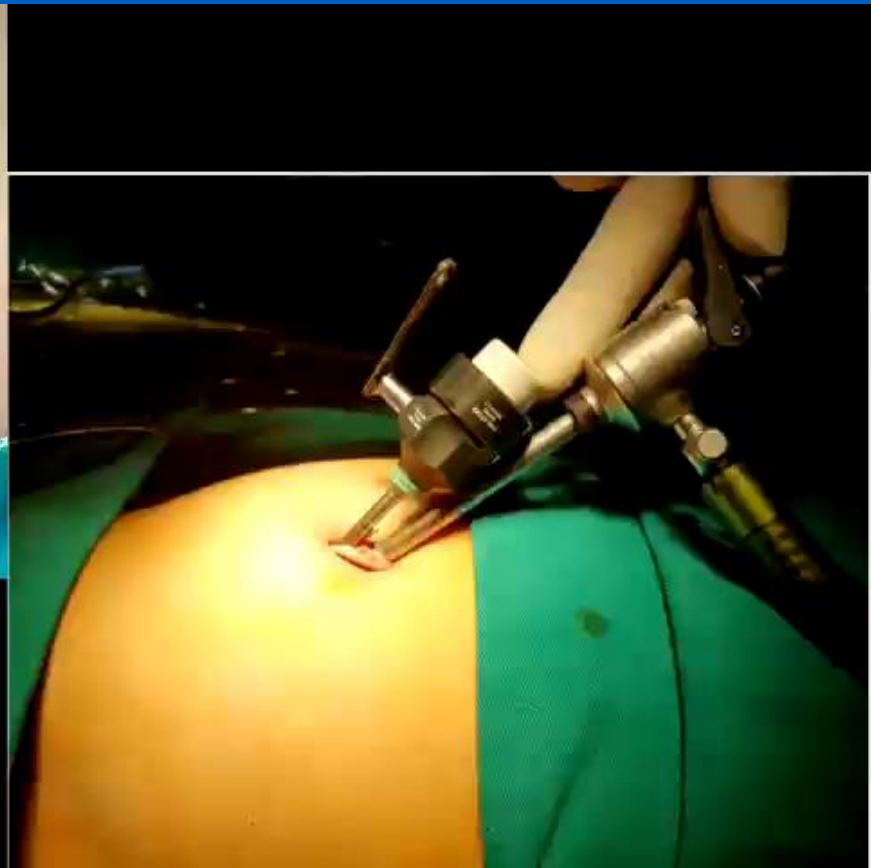
- To evaluate the feasibility and effectiveness of single-incision laparoscopic extraperitoneal closure (SILPEC) of PPV without hydrocelectomy in primary hydrocele in children



Methods

- Prospective study on all children with primary hydrocele treated at our center between June 2016 and December 2021
- Inclusion criteria: boys aged 2 years or older with hydrocele, which had not been previously treated.
- Exclusion criteria:
 - patients with a history of lymph obstructive disease or surgical intervention on the inguinal, scrotal and/or adjacent regions
 - patients with peri-testicular fluid secondary to testicular/appendiceal torsion, inflammation, or tumor.
- All the patients with primary hydrocele underwent SILPEC by the same surgical team with the same surgical technical protocol.

Surgical technique



Results

Variables	Value
Number of patients	553
- Unilateral hydrocele	527
Right/left	331/196
- Bilateral hydrocele	26
Age (months) (median, min – max)	34 (22-162)
Operative time (minutes) (median, min - max)	
- unilateral procedure	17 (14-20)
- bilateral procedure	23 (21-37)
PPV	
- Ipsilateral side of hydrocele	553/553 (100%)
- Contralateral side/ unilateral hydrocele	209/527 (39,6%)
Hydrocele	
- Communicating hydrocele	394 (71,3%)
- PPV with no obvious communication	159 (28,7%)
Suture	
- Premicron 2/0	101
- PDS 2/0	171
- Prolene 2/0	281
Postoperative hospital stay (days) (median, min–max)	1(1-3)
Follow-up time (months) (median, min – max)	41 (6-72)
Complications	
- Inflammatory knot reaction suture	4/553 (7%)
- Scrotal hematoma	3 (0.5%)
- Iatrogenic cryptorchism	0
- Testicular atrophy	0
- Recurrence	2/553 (0.36%)

Results: postoperative cosmesis



Discussion

- In standard open surgery, the principle of treatment is high PPV ligation, and total or partial hydrocelectomy (fenestration)
→ the risk of intraoperative damage to the spermatic vessels and the vas
- Laparoscopic surgery has the advantages of less trauma, reduced postoperative pain, faster recovery, improved cosmesis, and fewer complications than conventional open surgery
 - Exploration of contralateral internal inguinal ring

Chen Y, et al. *A systematic review and meta-analysis concerning single-site laparoscopic percutaneous extraperitoneal closure for pediatric inguinal hernia and hydrocele*. Surg Endosc, 2017. **31**(12): 4888-4901

Discussion

- Simple puncture and aspiration alone proved to be ineffective in the management of hydrocele
- The principles of laparoscopic management of pediatric hydrocele are controversial:
 - Elhaddad (2022) and Choi (2017): same principles as open surgery: closure the PPV in the internal inguinal ring and hydrocelectomy or wide fenestration of the cyst.
 - Zhang (2018): LPEC treatment of hydrocele with high PPV ligation without hydrocelectomy had low recurrence rate than the traditional open repair



Discussion

- In this study, we performed LPEC for PPV without hydrocelectomy
- we found that ipsilateral PPV was present in all cases.
- In 28.7% of our patients, there was no obvious communication between hydrocele and peritoneal cavity. In these cases, we still ligated the PPV and evacuated the fluid in the cyst with a percutaneous needle, no recurrence was recorded



Discussion

- We suggest that in such cases, there is still a discrete one-way passage of the peritoneal fluid towards the scrotum but not the opposite.
 - The fluid in the primary hydrocele type is actually the peritoneal fluid, not a fluid produced by the hydrocele cyst itself
- *no need of hydrocelectomy*



Discussion

Author and year of publication	Number of patients	Laparoscopic approach	Techniques	Mean OT (mins)	Follow-up (months)	Recurrence
Elhaddad 2022	97	conventional	High PPV ligation+ hydrocelectomy	31	13.8 (6-23)	0%
Choi 2017	490	conventional two-port	High PPV ligation+ hydrocelectomy	16	17.5 (3-54)	0.2%
Wang 2017	279	single-port	High PPV ligation+ fluid aspiration	19.5	9 (6-29)	0.7%
Peng 2015	151	single-port	High PPV ligation+ fluid aspiration	26	21 (3-36)	0%
Zhang 2018	950	conventional two-port / single-incision / single-port	High PPV ligation+ fluid aspiration	16	32.5 (20-44)	1.1%
Yang 2015	284	conventional two-port	High PPV ligation+ fluid aspiration	16	22 (12-78)	1.4%
This study 2022	553	Single incision	High PPV ligation+ fluid aspiration	17	41 (6-72)	0.36%

Conclusions

- Ipsilateral PPV was present in all cases with primary hydrocele in our series.
- Our technique of SILPEC of PPV without hydrocelectomy is feasible, and safe, with excellent postoperative cosmesis in the management of primary hydrocele in children

Thank you!

