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Hydrocolpos in cloacal malformations

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Abstract

Introduction: Hydrocolpos is a condition rarely mentioned in the literature. The purpose of this report is to increase the index of suspicion for hydrocolpos in patients with cloaca and to describe our approach for its treatment with the hope that errors in the management of hydrocolpos can be avoided.

Methods: We reviewed 411 medical records of patients diagnosed with cloaca and managed at our Center during the last 26 years. Emphasis was placed on evaluating for the presence of hydrocolpos, type of drainage, and complications related to the persistence of the hydrocolpos.

Results: One hundred seventeen cloaca patients had an associated hydrocolpos (28.4%). Forty-two cases (36%) were initially managed at other institutions at which the hydrocolpos was not drained. Complications experienced by this group included: multiple urinary tract infections (8), hydrocolpos infection (7), sepsis (7), failure to thrive (6), ruptured hydrocolpos (4), and development of hydronephrosis in previously normal kidneys (2). Forty-one patients (35%) had other modalities of treatment, aimed to drain the hydrocolpos, including vesicostomy (26), intermittent perineal catheterization (8), single aspiration (6), or plasty of the perineal orifice (1). In all of these cases, the hydrocolpos persisted or reaccumulated. Thirty-four patients (29%) underwent an effective drainage of the hydrocolpos at birth; 29 at other institutions, 15 with a tube vaginostomy, 13 with a tubeless vaginostomy, and 1 with a catheter placed and left in the vagina through cystoscopy. Five cases had a tube vaginostomy done by us. In all these cases, the vagina remained adequately drained as demonstrated radiologically. Proper drainage of the hydrocolpos alone, with no urologic intervention, dramatically improved the hydronephrosis in 13 cases.

Conclusions: Hydrocolpos in patients with cloacas must be diagnosed and treated early in life. Our preferred approach is a transabdominal indwelling vaginostomy tube. The drainage of the hydrocolpos alone may dramatically improve the hydronephrosis, and therefore, we suggest that only after the hydrocolpos is drained should a urological intervention be contemplated. Failure to drain the hydrocolpos can result in serious complications.

Hydrocolpos is a distended vagina filled with fluid (Fig. 1). It is a condition rarely mentioned in the literature, and the majority of recent publications relate only to its prenatal diagnosis [1-6] not to its newborn management. Specific guidelines for treatment in patients with cloacas are not standardized, and unfortunately, failure to recognize and manage the hydrocolpos in this population can lead to complications [7,8].

The purpose of this review is to increase the index of suspicion for hydrocolpos in cloaca patients, to describe our

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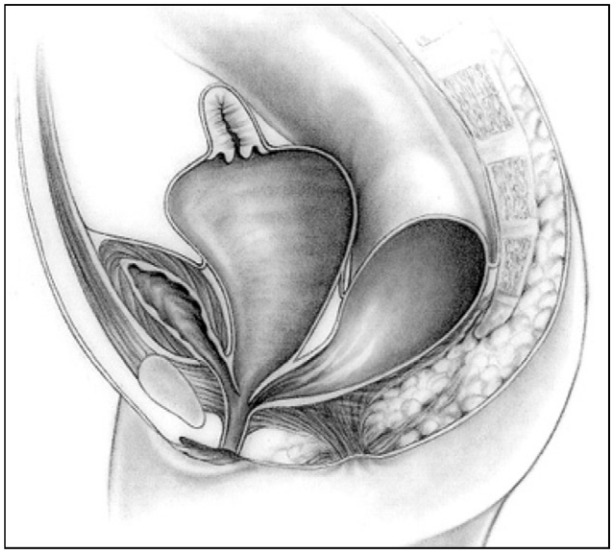


Fig. 1 Artistic drawing of a hydrocolpos in a patient with cloaca.

approach for its treatment with the hope that errors in the management of hydrocolpos can be avoided.

1. Methods

Four hundred eleven medical records of patients diagnosed with cloacas and managed at our center during the last 26 years were reviewed. Emphasis was placed on evaluating for the presence of hydrocolpos, type of drainage, and complications related to the persistence of the hydrocolpos.

The diagnosis of the hydrocolpos was made by a pelvic ultrasound specifically looking for a cystic structure behind the bladder. When patients were born at our institution, the ultrasound was performed during the first 24 hours of life. Our preferred method for draining the hydrocolpos was an indwelling vaginostomy tube with a pigtail catheter that was left in place until the definitive reconstruction. This was done at the time of colostomy opening [9]. A left lower quadrant incision was used in most cases (Fig. 2A), but in cases of a giant hydrocolpos, a midline laparotomy was preferred (Fig. 2B). The selection of the pigtail catheter is based on the fact that after the vagina is drained, it recedes from the abdominal wall, and the curled end of the catheter prevents it from falling out. When 2 hemivaginas were found, a window was created in the septum allowing for one tube to drain both hemivaginas.

We obtained institutional review board approval (2008-1132) for this study.

2. Results

Of 411 cloacas, 117 had an associated hydrocolpos (28.4%).

In 42 cases (36%), managed at other institutions, the hydrocolpos was not drained during the newborn period (Table 1). Complications were found in 24 of these patients (57%), including multiple urinary tract infections (8), infected hydrocolpos (pyocolpos) (7), sepsis (7), failure to thrive (6), ruptured hydrocolpos (4) and development of hydronephrosis in previously normal kidneys (2). Due to these complications, 5 patients required emergency drainage of the hydrocolpos, performed later in their original institutions. In 37 patients, the hydrocolpos was treated by us, during the main repair, since the procedure includes mobilization, pull-through, and anastomosis of the vagina to the perineum.

Forty-one patients (35%) (Table 1) underwent procedures, aimed to drain the hydrocolpos, at other institutions, including vesicostomy (26), intermittent perineal catheterization (8), single aspiration (6), or plasty of the perineal orifice (1). In these patients, reaccumulation or persistence of the hydrocolpos occurred. In 29 of these cases, the hydrocolpos was treated by us during the repair of the cloaca. Seven patients underwent late effective tube vaginostomy drainage at their original hospital. Five patients

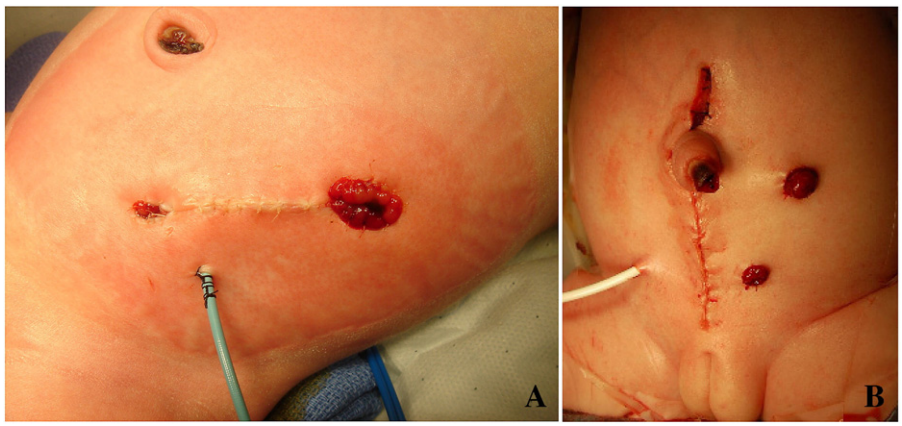


Fig. 2 Two possible incisions for colostomy and tube vaginostomy. A, Oblique. B, Midline.

Table 1 Hydrocolpos drainage in 117 patients with cloaca

117 Patients with hydrocolpos	42 Not drained at birth	37 Treated during main repair (our institution) [a] 5 Late drainage owing to complication (other institutions)
	41 Underwent different procedures aimed to drain the hydrocolpos that persisted or recurred	29 Treated during the main repair (our institution) [a] 7 Late drainage (other institution) 5 Drained by us on emergency basis, prior to the main repair
	34 Effectively drained at birth	29 Other institution 5 Our institution

[a] The surgical repair of a cloaca, by definition, takes care of the hydrocolpos because the vagina is opened into the perineum.

received an emergency tube vaginostomy drainage performed by us, prior to the main repair.

Thirty-four patients (29%) (Table 1) underwent an effective drainage of their hydrocolpos at birth; 29 done at other institutions, 15 with a tube vaginostomy, 13 with a tubeless vaginostomy, and 1 with a catheter placed and left in the vagina through cystoscopy. Five cases had a tube vaginostomy done by us. In all of these cases, the vagina(s) remained adequately drained, as demonstrated by subsequent ultrasound studies, and the patient had no complications.

Adequate drainage of the hydrocolpos alone dramatically improved the hydronephrosis in 13 patients (Table 2). Ten of them were done at other institutions: 8 with a tube vaginostomy, 1 with a catheter placed and left in the vagina through cystoscopy, and 1 with intermittent catheterization performed through the single perineal orifice. The drainage of the hydrocolpos did not improve the hydronephrosis in 5 cases of severe vesicoureteral reflux (2), ectopic ureters (1), and poor bladder drainage owing to neurogenic bladder (1), and stenosis of the common channel (1).

Of the 117 with hydrocolpos, 93 (79.5%) were bilateral (2 hemivaginas) (Fig. 3) (Table 3), 20 were single, and in 4 patients, the original hydrocolpos status was unknown, since they came to us only for reoperations. One hundred five patients had associated urological anomalies; the most frequent was hydronephrosis followed by vesicoureteral reflux. Common channel atresia or stricture was only found in 6 patients (Table 4).

All patients subsequently received a definitive repair of the cloacal malformation at our center.

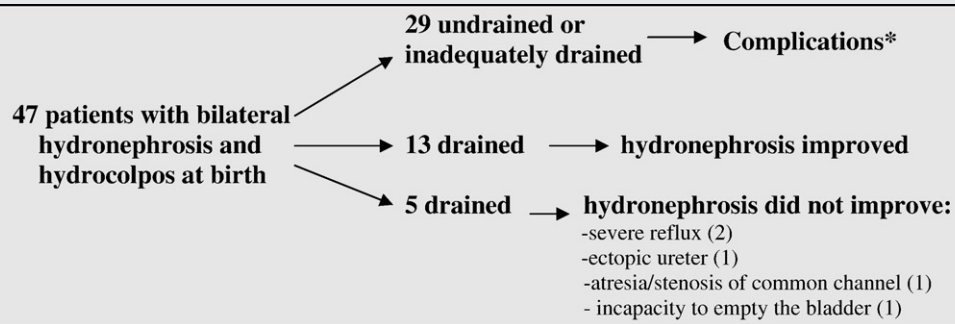
3. Discussion

This is a retrospective review of a highly selective series from a referral center. Therefore, this experience may not be generalized. It is possible that many cases are successfully managed at other institutions using methods that are different from our preferred technique for the treatment of hydrocolpos [6]. Our observations, however, are based on the problems that we saw in this select group, and we believe that these findings are important and may help to avoid complications in future patients with hydrocolpos. In addition, regardless of the modality of treatment chosen to drain the hydrocolpos, we recommend that clinicians should document the result with an ultrasound study, to show that the vagina is empty, and with subsequent studies, to be sure that the fluid does not reaccumulate.

In this series, almost 30% of patients born with a cloaca had hydrocolpos (Fig. 1); therefore, it is mandatory to suspect and diagnose this condition in this group of patients.

The consequences of not draining the hydrocolpos are summarized in Fig. 4. The most common is compression of the trigone, causing extrinsic ureterovesical obstruction, leading to megaureters and hydronephrosis, which can ultimately cause kidney damage. Another consequence may be infection, called

Table 2 Hydrocolpos drainage and hydronephrosis status in patients with bilateral hydronephrosis and hydrocolpos



* Persistence of the hydrocolpos and hydronephrosis despite vesicostomy (14), sepsis (4), pyocolpos (3), ruptured hydrocolpos (3), failure to thrive (2), urinary tract infections (2).

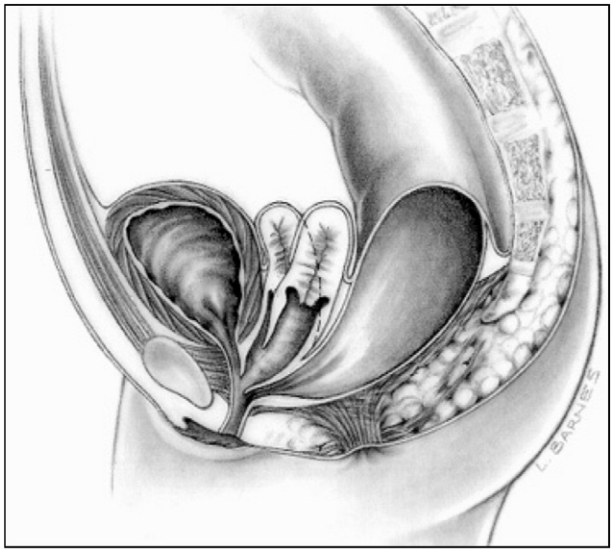


Fig. 3 Artistic diagram of a cloaca with two hemivaginas and hemiuterii.

pyocolpos, which leads to inflamed vaginal tissue and subsequent scarring, making it potentially inadequate for future reconstruction. Finally, there is the risk of vaginal perforation with severe peritonitis, which represents a surgical emergency and provokes damage to the vagina, which can interfere with the future reconstruction. The complications found in our series (sepsis, perforation) when the hydrocolpos was not drained have also been reported by others [3,10,11] as well as more serious ones like complete resection of the dilated vagina owing to an erroneous diagnosis of a "mass of unknown origin" and death [2,12-14]. These complications can be avoided with a good index of suspicion and correct and prompt treatment of the hydrocolpos.

A congenital stricture of the common channel was documented in only 6 patients. That obstruction may exacerbate the accumulation of fluid in the vagina. In all other cases, we could not explain why the vagina was tense and full of fluid, despite a patent common channel. However, the fact that we do not know the etiology of the hydrocolpos does not invalidate the need to drain it because we know the consequences of not doing it.

The most common urological anomaly found was hydronephrosis (63 patients, 23 with megaureters). The presence of hydronephrosis should prompt the clinician to eliminate a possible mass effect in the pelvis, compressing the trigone and the ureterovesical junction, caused by the hydrocolpos. This was demonstrated in 13 of our patients in whom the hydronephrosis improved after the hydrocolpos alone was drained. The second most common urologic abnormality was vesicoureteral reflux (37 cases). Drainage of the hydrocolpos does not influence this abnormality. Five patients, in whom the hydronephrosis did not improve after the hydrocolpos was drained, suffered from vesicoureteral reflux, ectopic ureter, and poor bladder drainage, which explains why the hydronephrosis persisted. For this reason, we believe that the first step in the management of patients with hydrocolpos and hydronephrosis should be drainage of the hydrocolpos which is expected to improve the hydronephrosis in most cases. If the hydronephrosis persists, then a urological intervention might be needed.

Table 3 Gynecologic anatomy of 117 patients with hydrocolpos

Gynecologic anatomy in 117 patients with hydrocolpos	12 Normal	Single vagina, single cervix, normal uterus
	105 Abnormal	93 with 2 hemivaginas and hemiuterii
		6 Bicornuate uterus
		5 Hemiuterus
		1 Labial lipoma with perineal hemangioma

Table 4 Urological anomalies in 117 patients with hydrocolpos

	12 Without urological anomalies	
Urological anomalies in 117 patients with hydrocolpos [a]	63 with hydronephrosis	47 Bilateral
		16 Unilateral
	37 with vesicoureteral reflux	25 Bilateral
		12 Unilateral
	27 Absent/nonfunctional kidney	16 Right
		11 Left
	23 Megaureter	13 Bilateral
		10 Unilateral
	8 Accessory urethra	
	6 Common channel atresia/stricture	
	4 Horseshoe kidney	
	Others: crossed renal ectopia, ectopic ureter, ureterocele, bladder diverticulum	

[a] Many patients had more than one urological anomaly.

4. Conclusions

Hydrocolpos in patients with a cloaca must be diagnosed and treated early in life. Our preferred approach is a

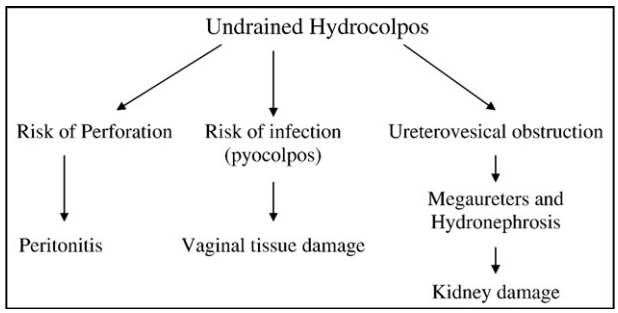


Fig. 4 Summary of the possible consequences of not draining a hydrocolpos.

transabdominal indwelling vaginostomy tube. This alone may dramatically improve the hydronephrosis. Only after the hydrocolpos is drained should a urological intervention be contemplated. Failure to drain the hydrocolpos can result in serious complications.

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Discussion

David Wesson, MD (Houston, Tex): It looks very obvious on the illustration that you gave, but are there any tricks to the diagnosis at the time of initial assessment of a baby with cloacal malformation?

Andrea Bischoff, MD (Cincinnati, Ohio) (response): Since 30% of our patients have hydrocolpos, our advice is that doing, as soon as the patient is born, to have a pelvic ultrasound. In the pelvic ultrasound, the radiologist will find a cystic mass behind the bladder, and then at the colostomy opening, the hydrocolpos should be drained.

David Wesson, MD: Any special tips to the drainage procedure? Do you put Pezzar tube in or any other advice?

Andrea Bischoff, MD (response): I have a picture of that. Since 80% of our patients have two hemi-vaginas and hemi-uteri , we usually advise two types of incisions. One is the midline incision, and the second one is the incision that we traditionally use for the colostomy opening. If it's a large hydrocolpos, during the midline incision, you can go above the hydrocolpos, you have to open the vagina and then you have to create a septum, you have to create a window in the septum, so one tube drains both hemi-vaginas. And it's important that this tube stays inside until the final repair.