

Supplementary Tables

Imperforate Hymen: A Comprehensive Systematic Review

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Supplementary Table S1. Checklist summarizing compliance with PRISMA guidelines

Topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3-4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4-5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4-5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	4-5
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4-5 (Figure1)
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4-5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Supplementary Tables and Tables
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	N/A
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A
RESULTS			
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Supplementary Table 1
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	N/A
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	5-8, Tables, Supplementary Table
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	5-8, Tables, Supplementary Table

Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Supplementary Tables
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	8-10
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	9-10
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	10
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	10

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Supplementary Table S2. List of case-reported characteristics including presenting symptoms as well as treatment outcomes and comorbidities

Author(year)	Age	Patient's country	Gynecological history	Presenting symptom(period)	Combined abnormality	Number of doctor(s) for diagnosis	Treatment	Amount of drained fluid after treatment(mL)	Outcome
Bekaert et al. (2018) [1]	14 years old	Belgium	-	Chronic back pain Abdominal pain	-	-	Hymenotomy	-	Improved
Reggiani et al.(2018) [2]	Neonate (8 days old)	Mozambique	-	Fever, septic condition Abdominal distention Thoraco-abdominal respiration Tense bulgingmembrane at vaginal introits,	Obstructive uropathy subsequent urosepsis, bladder perforation.	-	Laparotomy	-	Improved
Elshiani et al. (2018) [3]	27 years old	Kosovo	-	Problems with sexual intercourse. Problems with pregnancy and cesarean delivery	-	-	Hymenectomy	-	Improved
Ghafri et al. (2018) [4]	15 years old	Oman	-	Amenorrhea Abdominal distension	Obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) syndrome	-	- (Only recommended vaginoscopy and laparoscopy with vaginal septal resection)	-	-
Brito et al. (2018) [5]	19 years old	Brazil	-	Amenorrhea Cyclic periodic lower abdominal and pelvic pain Abdominal distension	-	-	Hymenotomy Oral antibiotics	3000	Improved
Kotter et al.(2017) [6]	14 years old	USA	-	Intermittent lower abdominal pain(3weeks) abdominal distension, constipation, breast tenderness	-	-	Hymenectomy	900	Improved
Saleh et al. (2017) [7]	12 years old	USA	Precocious puberty	Abdominal pain (2 weeks) Urinary frequency (few weeks) Non bloody emesis Primary amenorrhea	Endometriosis	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	Neonate (1 week)	India	Peter plus syndrome	Bilateral corneal opacity syndrome Renal failure	Bilateral hydroureterone phrosis	-	Hymenectomy	-	Improved

Ramareddy et al.(2017) [8]	12 years	India	-	Abdominal pain Bladder distension Anuria	-	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	9 years	India	-	Irritative and obstructive bladder	Vesicoureteral reflux	-	Stage repair	-	Improved
Ramareddy et al.(2017) [8]	Neonate (2 weeks)	India	-	Pubic diastasis	Bladder exstrophy-epispadias complex	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	14 years	India	-	Primary amenorrhea Cyclic abdominal pain	-	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	11 years	India	-	Primary amenorrhea Cyclic abdominal pain	-	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	12 years	India	-	Acute urinary retention	-	-	Hymenectomy	-	Improved
Ramareddy et al.(2017) [8]	11 years	India	-	Abdominal pain Acute urinary retention	-	-	Abdominoperineal pull-through	-	Improved
Zhang et al.(2017)[9]	13 years old	China	-	Amenorrhea Intra-labial and pelvic mass(4months)	-	-	Hymenectomy	-	-
Adam et al.(2017)[10]	3 years old	South Africa	-	Recurrent UTI Distended bladder	McKusick-Kaufman syndrome (MKKS)	-	Hymenectomy	-	-
Elgyoum et al. (2016) [11]	16 years old	Sudan	-	Cyclic lower abdominal pain, palpable suprapubic mass, primary amenorrhea	-	-	-	-	-
Ramphul et al.(2016)[12]	Neonate	UK	-	-	-	-	Hymenectomy	-	-
Laghzaoui et al.(2016)[13]	16 years old	Morocco	-	Cyclic pelvic pain(4years) Primary amenorrhea	-	-	Hymenectomy and vaginoplasty	2000	Improved
Nagaraj et al.(2016)[14]	3 days old	India	-	Abdominal distension Lower limb swelling	Bilateral hydronephrosis	-	Hymenectomy	-	Improved
Tilahun et al.(2016)[15]	23 days old	Ethiopia	-	Abdominal swelling Urinary retention Tachypnea (20 days) Renal failure	Bilateral hydronephrosis,	-	Hymenectomy	1250	Died(cause: sepsis and AKI)
L älgén et al.(2016)[16]	13 years old	Switzerland	-	Primary amenorrhea Severe back pain Urinary incontinence	-	-	Hymenectomy	1400	Improved
Ossman et al.(2016)[17]	16 years old	Egypt	3 hymenectomy	lower abdominal pain, Urinary retention,	-	-	Hymenectomy	600	Improved

				Secondary amenorrhea (1.5 month)					
Segal et al. (2015) [18]	13 years old	USA	Labial Adhesions (treated topical estrogen)	Mild dysmenorrhea Inability to insert a tampon.	-	-	Progressive cervical dilators	-	Improved
Segal et al. (2015) [18]	16 years old	USA	-	Dysmenorrhea Inability to insert a tampon.	-	-	Progressive cervical dilators	-	Improved
Al-Hunaidi et al.(2015)[19]	23 years old	Kuwait	Hymenotomy for imperforate hymen	Urinary retention (1day) Amenorrhea(6months)	-	1	Hymenectomy	1200	Improved
Glavan et al. (2015)[20]	16 months old	Croatia	-	Redness and edema of vaginal ostium	-	2	Observation	-	-
Lynn Coppola(2016)[21]	adolescent	Ghana	Irregular menstruation	Urinary retention Leg pain	-	1	Hymenectomy	500	Improved
Koyama-Sato et al.(2015)[22]	16 years old	Japan	-	Cyclinc lower abdominal pain Primary amenorrhea	Transverse vaginal septum	2	Hymenectomy Vaginal septum repair	-	Vaginal canal adhesion(6m onths)
Greene et al.(2015)[23]	14 years old	USA	-	Fecal frequency and urgency(1year) Urinary frequency(1year) Pelvic pain(1year)	-	2	Hymenectomy	-	Improved
George et al.(2015)[24]	14 years old	germany	-	Abdominal pain(1year) Polyuria(1month) Primary amenorrhea	-	1	Hymenectomy Prophylactic antibiotics	2400	Reclosure of hymen(2mon ths)
Ulku et al.(2015)[25]	15 years old	Turkey		Cyclic lower abdominal pain(1year)	Escobar syndrome	1	Eliptical hymenotomy	1000	Improved
Plaza-Benhumea et al.(2014)[26]	12 years old	Mexico	-	-	Langer– Giedion syndrome	1	Hymenoplasty Vaginal dilator therapy	-	Improved
Ho et al.(2014)[27]	14 years old	Australia	-	Lower abdominal pain(1day) Heavy bleeding per vagina(1day)	-	1	Cruciate hymenotomy	-	Improved
Dilbaz et al.(2014)[28]	13 years old	Turkey	-	Worsening lower abdominal pain(4months)	Transverse vaginal Septum	1	Hymenectomy Laparotomy because of rupture of abscess	200	Improved
Fischer et al.(2014)[29]	12 years old	Canada	-	Dysuria(3days) Constipation(3days) Perineal pain and pruritus(3days)	-	1	Hymenectomy	-	-

Salhan et al.(2013)[30]	12 years old	UK	-	Acute urinary retention(1day) Lower abdominal pain(1day) Dysuria(1day)	-	1	Cruciate hymenotomy	-	Improved
Vitale et al.(2013)[31]	3 days old	Italy	-	Abdominal mass	-	1	Hymenotomy	100	Improved
Christodoulidou et al.(2013)[32]	13 years old	UK	-	Lower abdominal pain(1day) Urinary retention(1day)	-	3	Cruciate hymenotomy	-	Improved
Mwenda AS.(2013)[33]	14 years old	Kenya	-	Lower abdominal pain(1week) Tenesmus(1week)	-	1	X-shaped hymenotomy	600	Improved
Domany et al.(2013)[34]	13 years old	Israel	-	Back pain(6months) Loss of appetite(6months)	-	2	Hymenotomy	1000	Improved
Rabani SM.(2013)[35]	11 years old	Iran	-	Cyclic abdominal pain(6months) Urinary retention	-	1	Hymenotomy	1000	Improved
Rabani SM.(2013)[35]	13 years old	Iran	-	Lower abdominal pain(6months) Urinary retention	-	1	Hymenotomy	-	Improved
Gupta et al.(2013)[36]	11 years old	India	-	Lower abdominal pain (1day) Dysuria(1day)	Transverse vaginal septum	1	Hymenectomy, Excision of transverse vaginal septum followed by dilatation	-	Fusion of vaginal septum(19days)
Das et al.(2012)[37]	15 years old	UK	-	Urinary retention Cyclic lower abdominal pain(12months)	-	2	Hymenectomy	400	Improved
Mwampagatwa et al.(2012)[38]	16 years old	Tanzania	-	Urinary retention(1day) Lower abdominal pain	-	3	Hymenectomy	1500	Improved
Sarathi et al.(2012)[39]	18 months old	India	Central precocious puberty	Appearance of pubic hair and breast Enlargement(2months)	Vaginal atresia	1	Vaginal pull-through procedure, GnRH agonist	-	Improved
Eksioglu et al.(2012)[40]	8 months old	Turkey	-	Fever of unknown origin	Bicornuate uterus	1	Cruciate hymenotomy	500	-
Nagai et al.(2012)[41]	35 days old	Japan	-	Abdominal distension Bilateral leg edema Venous distension Renal failure	-	1	Hymenectomy	100	Improved
Temizkan el al.(2012)[42]	15 years old	Turkey	-	Lower abdominal pain(15days)	-	1	Central hymenotomy	700	Improved

				Back pain(15days)					
Poll et al.(2011)[43]	15 years old	Germany	-	Adominal pain(4days)	-	1	Hymenotomy	2000	-
Kurdoglu et al.(2011)[44]	13 years old	Turkey	-	Cyclic abdominal pain	-	1	Self limited(upper half of hymen)	-	Improved
Ercan et al.(2011)[45]	15 years old	Turkey	-	Lower abdominal pain Urinary retention	-	2	Vertical hymenotomy	1000	Improved
PDino et al.(2011)[46]	12 years old	Croatia	-	Repeated urinary retention(1year) Repeated abdominal pain(1year) Renal failure	-	1	Hymenectomy	1500	Improved
Khan et al.(2011)[47]	19 years old	UK	Menstruation	Lower abdominal pain Urinary retention Dysuria(2weeks) Urinary frequency(2weeks)	-	1	Cruciate hymenotomy	600	Improved
Ameh et al.(2011)[48]	2 days old	Nigeria	-	-	Persistent cloaca	-	Hymenotomy	-	Improved
Ameh et al.(2011)[48]	3 days old	Nigeria	-	-	Persistant cloaca	-	Hymenotomy	-	-
Abu-Ghanem et al.(2011)[49]	Adolescent	Israel	Simple vertical hymenotomy for imperforate hymen	Urinary retention(3days) Dysuria(3days) Lower abdominal pain(3days)	-	2	Hymenectomy	500	Improved
Anselm et al.(2010)[50]	14 years old	Nigeria	-	Urinary retention Lower abdominal pain(2weeks)	-	2	Cruciate hymenotomy	1000	Improved
Zhou et al.(2010)[51]	Infant	China	-	-	Systemic aplasia cutis congenita	-	-	-	Died(cause:a sphyxia and dehydration)
Adenuga et al.(2010)[52]	Infant	USA	-	-	-	-	-	-	-
Drakonaki et al.(2010)[53]	12 years old	Greece	-	Abdominal discomfort(48hours) Back pain(48hours)		1	Hymenotomy	-	Improved
Kloss et al.(2010)[54]	12 years old	USA	-	Lower abdominal pain(1month)		1	-	-	-
Mou et al.(2009)[55]	12 years old	Hong Kong	-	Cyclic lower abdominal pain(2months)	-	-	Hymenotomy	600	Improved
Mou et al.(2009)[55]	12 years old	Hong Kong	-	Lower abdominal pain(5months)	-	1	Hymenotomy	500	Improved

				Tenesmus(5months) Dysuria(5months)					
Mou et al.(2009)[55]	13 years old	Hong Kong	-	Repeated lower abdominal pain(10months)	labial adhesion	-	Mini-hymenotomy	500	re-do hymenotomy (6 th month after operation)
Oakes et al.(2010)[56]	14 years old	USA	-	Pelvic pain(5months)	Uterocervicovaginal septum	1	Hymenotomy, vaginal septoplasty	400	Improved
Dhabalia et al.(2009)[57]	25 years old	India	-	Primary infertility(4years) Dyspareunia(4years)	Urethrovaginal fistula	1	Hymenotomy Excision of fistula	-	Improved
Partsinevelos et al.(2009)[58]	12 years old	UK	-	Cystic tumor evaluation Lower abdominal pain(2weeks)	-	2	Hymenectomy	-	Improved
Basaran et al.(2009)[59]	13 years old	Turkey	-	Lower abdominal pain Urinary retention	-	1	Midline vertical hymenotomy	-	Improved
Oguzkurt et al.(2009)[60]	6 years old	Turkey	-	High fever Abdominal pain	Urethrovaginal fistula Primary vaginal calculus	2	Hymenotomy Simple closure of the fistula Extraction of vaginal canal	-	Improved
Kalmantis et al.(2009)[61]	15 years old	Greece	-	Lower abdominal pain(48hours) Dysuria Urinary frequency	-	1	Hymenectomy	1500	Improved
Sharifiaghdas et al.(2009)[62]	20 days old	Iran	-	Abdominal distension Urinary retention	-	1	Small crossed hymenotomy	100	Improved
Gyimadu et al.(2009)[63]	12 years old	Turkey	-	Lower abdominal pain(24horus) Urinary retention(24horus)	-	6	Cruciate hymenotomy	450	Improved
Johal et al.(2009)[64]	2 days old	UK	-	Large interlabial swelling Urinary retention Vomiting	-	1	Hymenotomy	100	Improved
Lardenoije et al.(2009)[65]	16 years old	Netherland	-	Primary amenorrhea Cyclical abdominal pain(1year)	-	1	Hymenectomy	500	Improved
Kumar et al.(2008)[66]	11 years old	USA	-	Abdominal pain(2days) Lower back pain(2days) Dysuria	-	1	Hymenotomy	-	Improved

Adali et al.(2009)[67]	12 years old	Turkey	-	Urinary retention Lower abdominal pain(1month) Urinary hesistency(1week)	-	2	Cruciate hymenotomy	1000	Improved
Hsu et al.(2008)[68]	12 years old	Taiwan	-	Lower abdominal pain Urinary retention	Hematocolpom etra	3	Laparoscopic adhesiolysis Cautery of the endometriosis	-	Improved
Hijazeen R.(1998)[69]	5 days old	Jordan	-	Diarrhea Rapid breathing Poor feeding	-	1	Hymenotomy	-	Improved
Chang et al.(2007)[70]	12 years old	Taiwan	-	Urinary retention(12hours) Lower abdominal pain	-	2	Cruciate hymenotomy	-	Improved
Buyukbayrak et al.(2008)[71]	13 years old	Turkey	-	Urinary retention Abdominal distention Abdominal discomfort	-	2	T incision hymenotomy	300	Improved
Deligeoroglou et al.(2007)[72]	14 years old	Greece	-	Lower abdominal pain Urine retention Non-specific abdominal complaints	Transverse vaginal septum Unicornuate uterus	1	Hymenectomy Excision of transverse vaginal septum	200	Improved
Dane et al.(2007)[73]	16 years old	Turkey	-	Lower abdominal pain(7days) Urinary retention(5days)	-	2	Cruciate hymenotomy	500	Improved
Dane et al.(2007)[73]	14 years old	Turkey	-	Urinary retention(2days) Lower abdominal pain(2days)	-	1	Cruciate hymenotomy	-	Improved
Khemchandani et al.(2007)[74]	11 months old	India	-	Straining during urination Repeated urinary retention	-	1	Cruciate hymenotomy	-	Improved
Bajaj et al.(2006)[75]	Infant	UK	-	Bulging mass at the vaginal introitus	-	1	Cruciate hymenotomy	200–300	Improved
Walsh et al.(2006)[76]	14 years old	USA	-	Abdominal pain(2days) Back pain(2days) Urinary retention Constipation	-	More than 7	Hymenectomy	1000	-
Shen et al.(2006)[77]	2 years old	Taiwan	-	Fever of unknown origin(4days) Lethargy Loss of appetite	-	2	Partial hymenotomy	150	Improved
Levsky et al.(2006)[78]	14 years old	USA	-	Repeated lower abdominal pain(2months)	Bicornuate uterus	3	Hymenotomy	500	Improved

Aygun et al.(2006)[79]	5 days old	Turkey	-	Abdominal distension Renal failure	-	2	hymenotomy	150	Improved
Sakalkale et al.(2005)[80]	13 years old	New zealand	Familial history of imperforate hymen	Lower abdominal pain(36hours) Urinary retention(36hours)	-	1	Hymenotomy	600	Improved
Sakalkale et al.(2005)[80]	14 years old	New zealand	Familial history of imperforate hymen	Cyclical lower abdominal Pain(3months)	-	1	hymenotomy	400	Improved
Eskandar et al.(2004)[81]	15 years old	UK	Familial history of imperforate hymen	Primary amenorrhoea Cyclic lower abdominal pain	Duplex left kidney	2	Hymenectomy	-	Improved
Eskandar et al.(2004)[81]	17 years old	UK	-	Primary amenorrhoea Cyclic lower abdominal pain	Angiomyolipoma arises primarily in the kidneys	-	Hymenectomy	-	Improved
Wang et al.(2004)[82]	-	Taiwan	-	chronic constipation and intermittent low back pain/6months	-	-	-	-	-
Posner et al.(2005)[83]	22 days old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	3months old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	4months old	USA	Familial history of imperforate hymen	-	-	-	-	-	-
Posner et al.(2005)[83]	7months old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	21months old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	2 years old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	2.1 years old	USA	Familial history of imperforate hymen	-	-	-	-	-	-
Posner et al.(2005)[83]	2.1 years old	USA	-	-	-	-	-	-	-
Posner et al.(2005)[83]	3.7 years old	USA	-	Dysuria	-	-	-	-	-
Posner et al.(2005)[83]	10.9 years old	USA	-	Vomiting Lower abdominal pain	-	-	-	-	-
Posner et al.(2005)[83]	11.3 years old	USA	-	Abdominal pain Dysuria	-	-	-	-	-
Posner et al.(2005)[83]	11.5 years old	USA	-	Abdominal pain(1month) Back pain(1month)	-	-	-	-	-
Posner et al.(2005)[83]	11.7 years old	USA	-	Dysuria Abdominal pain	-	-	-	-	-
Posner et al.(2005)[83]	12.2 years old	USA	-	Dysuria(1week)	-	-	-	-	-
Posner et al.(2005)[83]	12.2 years old	USA	-	Abdominal pain(2weeks)	-	-	-	-	-

Posner et al.(2005)[83]	12.3 years old	USA	-	Urinary retention(1day)	-	-	-	-	-
Posner et al.(2005)[83]	13.3 years old	USA	-	Lower abdominal pain(2months)	-	-	-	-	-
Posner et al.(2005)[83]	13.3 years old	USA	-	Urinary retention(2months) Back pain(2months) Abdominal pain(2months)	-	-	-	-	-
Posner et al.(2005)[83]	13.6 years old	USA	-	Cyclic abdominal pain(4months) Dysuria(4months)	-	-	-	-	-
Posner et al.(2005)[83]	13.8 years old	USA	Familial history of imperforate hymen	Abdominal pain(3months)	-	-	-	-	-
Posner et al.(2005)[83]	13.9 years old	USA	-	Repeated abdominal pain(2weeks) Dysuria(1day)	-	-	-	-	-
Posner et al.(2005)[83]	14.2 years old	USA	-	Abdominal pain(2days)	-	-	-	-	-
Stone et al.(2004)[84]	11 years old	USA	-	Abdominal pain(24hours) Nausea(2days) Urinary frequency(2days) Dysuria(2days)	-	1	Hymenotomy	300	Improved
Lim et al.(2003)[85]	14 years old	Malaysia	Familial history of imperforate hymen	Cyclic abdominal pain(6months)	-	2	Hymenectomy	-	Improved
Lim et al.(2003)[85]	11 years old	Malaysia	Familial history of imperforate hymen	Urinary retention(1day) Abdominal pain(1day)	-	1	Hymenectomy	800	Improved
Chircop R.(2003)[86]	13 years old	UAE	-	Lower abdominal pain(12hours) Urinary retention(12hours) Urinary frequency(2days) Urinary urgency(2days)	-	1	hymenotomy	1000	Improved
Wall et al.(2003)[87]	12 years old	USA	-	Fever(3days) Nausea(3days) Vomiting(3days) Lower abdominal pain(3days)	-	2	Hymenotomy	-	-
Kumar et al.(2002)[88]	-	India	-	Lower abdominal pain Urinary retention	-	-	Hymenotomy	-	-
Kumar et al.(2002)[88]	-	India	-	Lower abdominal pain Urinary retention	-	-	Hymenotomy	-	-

Hu et al.(2001)[89]	infant	USA	-	Non-immune hydrops Respiratory distress	-	2	Hymenotomy	-	Improved
Botash et al.(2001)[90]	9 years old	USA	Physical abuse	Child abuse referral and evaluation program evaluation	-	3	-	-	-
Botash et al.(2001)[90]	12 years old	USA	Physical abuse	Child abuse referral and evaluation program evaluation	-	1	-	-	-
Botash et al.(2001)[90]	3 years old	USA	Possible sex abuse	Child abuse referral and evaluation program evaluation(for sibling's abuse)	-	1	-	-	-
Lok et al.(2001)[91]	13 years old	China	-	Lower abdominal pain(2days) Urinary frequency constipation	-	1	Cruciate hymenotomy	-	Iatrogenic pyocolpos from needle puncture
Stelling et al.(2000)[92]	12 years old	USA	Familial history of imperforate hymen	Evaluation for familial history of imperforate hymen	-	1	Hymenectomy	-	Improved
Stelling et al.(2000)[92]	14 years old	USA	Familial history of imperforate hymen	Peritoneal signs	-	1	Hymenectomy	-	Improved
Stelling et al.(2000)[92]	14 years old	USA	Familial history of imperforate hymen	Evaluation for familial history of imperforate hymen	-	1	Hymenectomy	-	Improved
Anguenot et al.(2000)[93]	14 years old	Switzerland	-	Cyclic lower abdominal Pain(6months)	-	1	Radial hymenotomy	200	Improved
Buick et al.(1999)[94]	14 years old	UK	-	Back pain(72hours) Urinary incontinence(72horus) Constipation(72hours) Sudden chest pain with swelling of the upper torso	-	3	Cruciate hymenotomy	1000	Improved
Ahmed et al.(1999)[95]	12 years old	Australia	-	Repeated lower abdominal pain(3months)	Transverse vaginal septum	2	Cruciate hymenotomy Perforation and dilatation of septum	100	Improved
Cicinelli et al.(1999)[96]	-	Italy	Regular menstruation	Abdominal pain during menses(8months)	Didelphys uterus Ipsilateral renal agenesis	2	Hymenotomy Resectoscopic repair	-	Improved
Hall DJ.(1999)[97]	15 years old	UK	-	Lower abdominal pain(24hours)	-	1	Hymenotomy	1500	Improved

				Urinary retention					
Bakos et al.(1999)[98]	13 years old	Sweden	-	Lower abdominal pain(12hours) Nausea(12hours)	-	2	X-shaped hymenotomy Laparotomy for resection of ruptured right fallopian tube Salpingostomy for obliterated left fallopian tube	400	Improved
Pierce JT.(1999)[99]	14 years old	USA	Sexual abuse	Urinary incontinence	-	1	Perforation and dilatation of hymen	-	-
Kushnir et al.(1997)[100]	13 years old	USA	-	Cyclic lower abdominal pain(3months)	-	1	Partial hymenectomy	400	Improved
Tuncer et al.(1997)[101]	8 months old	Turkey	-	Acute abdomen Vomiting(4days) Urinary retention(4days) Constipation(4days)	Rupture of bladder	1	Puncture of the hymen Laparotomy for persisting symptom Bladder suturing	350	-
Brevetti et al.(1997)[102]	2 months old	USA	-	Abdominal distension(2days) Irritability(2days)	-	2	Hymenotomy	240	Improved
Bamshad et al.(1996)[103]	5 years old	USA	Familial history of ulnar mammary syndrome	-	Ulnar Mammary Syndrome	-	-	-	-
Bamshad et al.(1996)[103]	11 years old	USA	Familial history of ulnar mammary syndrome	-	Ulnar Mammary Syndrome	-	-	-	-
Bamshad et al.(1996)[103]	6 years old	USA	Familial history of ulnar mammary syndrome	-	Ulnar Mammary Syndrome	-	-	-	-
Robberecht et al.(1996)[104]	13 years old	Belgium	-	Abdominal pain(4days) Constipation(8days)	-	1	Diamond-shaped hymenotomy	1000	Improved
Peterson-Sweeney et al.(1996)[105]	13 years old	USA	-	Dysuria Urinary retention Back pain(1week)	-	2	Hymenectomy	800	Improved
Loscalzo et al.(1995)[106]	13 years old	USA	-	Lower abdominal pain(1week) Constipation(1week)	-	3	Hymenotomy	1200	Improved
Sanders et al.(1994)[107]	19 years old	USA	Misdiagnosed as mullerian agenesis treated	Primary amenorrhea Abdominal distention	-	-	Hymenectomy	1200	Improved

			with vaginal dilator						
Lodh et al.(1994)[108]	40 years old	India	-	Primary amenorrhea Abdominal mass Lower abdominal pain Urinary retention	-	1	Hymenectomy Removal of calculi in pelvis Irrigation of vaginal cavity with antibiotic solution	-	Improved
Usta et al.(1993)[109]	13 years old	Lebanon	Familial history of imperforate hymen	Cyclic lower abdominal discomfort	-	1	Cruciate hymenotomy	1500	Improved
Usta et al.(1993)[109]	16 years old	Lebanon	Familial history of imperforate hymen	Cyclic lower abdominal discomfort	-	1	Hymenotomy	1000	-
Usta et al.(1993)[109]	8 years old	Lebanon	Familial history of imperforate hymen	-	-	1	Observation	-	-
Nisanian AC.(1993)[110]	14 years old	USA	-	Urinary retention(12hours) Cyclic lower abdominal pain(2years)	-	1	Diamond-shaped hymenotomy Hymenectomy Prophylactic antibiotics	2600	Improved
Yu et al.(1993)[111]	16 years old	Taiwan		Urinary retention		1	Hymenotomy	1000	Improved
Yu et al.(1993)[111]	12 years old	Taiwan	-	Urinary retention Lower abdominal pain	-	1	Cruciate hymenotomy	500	Improved
Carlson et al.(1992)[112]	14 years old	USA	Regular menstruation	Lower abdominal pain(3days) Urinary frequency	Didelphic uterus with double vagina	2	Hymenectomy	500	Improved
Gangopadhyay et al.(1992)[113]	1 day old	India	-	Inability to pass meconium A balloon shaped mass in vulval area	Imperforate anus	1	Cruciate hymenotomy Anal cut back operation	20	-
Catić et al.(1988)[114]	16 years old	Yugoslavia	-	Abdominal pain(15days) Pelvic pain(15days) Flatulence(15days) Constipation(15days)	-	1	Hymenotomy	1000	-
Catić et al.(1988)[114]	15 years old	Yugoslavia	-	Abdominal pain(2months) Back pain(2months)	-	1	surgical incision of the imperforate hymen	1000	-
Berkowitz et al.(1987)[115]	6 years old	USA	Sexual abuse	Evaluation for sexual abuse	-	1	-	-	-
Dickson et al.(1985)[116]	14 years old	USA	Familial history of imperforate hymen	Abdominal pain(2days)	-	3	Partial hymenectomy	400	Improved

Dickson et al.(1985)[116]	14 years old	USA	Familial history of imperforate hymen	Syncope Diarrhea Vomiting	-	1	Partial	hymenectomy	200	Improved
Shaw et al.(1983)[117]	Neonate	UK	-	Abdominal distention Respiratory distress	-	-	-		-	-
Shaw et al.(1983)[117]	Neonate	UK	-	Anorectal atresia	Anorectal atresia	-	-		-	-
Shaw et al.(1983)[117]	Neonate	UK	-	Multiple anomalies	Cloaca Congenital heart defect	-	-		-	Died(cause: cardiorespiratory distress)
Shaw et al.(1983)[117]	Neonate	UK	-	Multiple anomalies	Congenital heart defect	-	-		-	Died(cause: respiratory distress)
Shaw et al.(1983)[117]	Neonate	UK	-	Multiple anomalies	Bicornuate uterus Anorectal atresia Congenital heart defect Sacral agenesis	-	-		-	Died(cause: respiratory distress)
Shaw et al.(1983)[117]	13 years old	UK	-	Abdominal pain Pelvic mass	Right cystic dysplastic kidney Right absent ureter Anorectal atresia Absent left radius	-	-		-	-
Shaw et al.(1983)[117]	9 years old	UK	-	Enuresis	-	-	-		-	-
Shaw et al.(1983)[117]	13 years old	UK	-	Abdominal pain Perineal bulge	-	-	-		-	-
Shaw et al.(1983)[117]	13 years old	UK	-	Abdominal pain Perineal bulge	-	-	-		-	-
Shaw et al.(1983)[117]	13 years old	UK	-	Abdominal pain Perineal bulge	-	-	-		-	-
Shaw et al.(1983)[117]	14 years old	UK	-	Abdominal pain Perineal bulge	-	-	-		-	-
Shaw et al.(1983)[117]	15 years old	UK	-	Appendicitis	-	-	-		-	-
Shaw et al.(1983)[117]	13 years old	UK	-	Appendicitis	Bilateral duplex ureter	-	-		-	-
Shaw et al.(1983)[117]	14 years old	UK	Regular	Appendicitis	Double genital	-	-		-	-

			menstruation		system				
Shaw et al.(1983)[117]	11 years old	UK	Regular menstruation	Abdominal pain Abdominal mass	Double genital system	-	-	-	-
Iuchtman et al.(1980)[118]	8 years old	Israel	-	Lower abdominal pain	Left hypoplastic kidney with ectopic ureter High aortic bifurcation	2	Hymenotomy	250	Improved
Amortegui et al.(1979)[119]	13 years old	USA	Known imperforate hymen	Abdominal cramps(2weeks)	Vaginal occlusion by an imperforate hymen	1	Hymenectomy	200	Improved
Nidecker et al.(1978)[120]	infant	Canada		Lower abdominal mass	Mild subluxation of the hips	1	Hymenotomy	-	Improved
Bejanga BI.(1978)[121]	16 years old	Cameroon		General discomfort(3weeks) Dysuria(1week) Constipation(1week) Abdominal pain		2	Simple hymenotomy	1700	Reclosure(14 days)
Kahn et al.(1975)[122]	1 month old	USA	-	-	-	1	Self-limited	-	-
Kahn et al.(1975)[122]	Neonate	USA	-	-	-	1	Self-limited	-	-
Gazit et al.(1975)[123]	6 months old	Israel	-	Inability to pass stools(3days)	-	1	Hymenectomy Prophylactic antibiotics	250	Improved
Hansen et al.(1975)[124]	13 years old	Denmark	-	Abdominal pain	-	1	Hymenectomy	500	Vaginal adenositis(2years)
Hansen et al.(1975)[124]	20 years old	Denmark	-	Primary amenorrhea Abdominal pain	-	1	Hymenectomy	1100	Vaginal adhesion (1month)
Hansen et al.(1975)[124]	14 years old	Denmark	-	Acute abdominal pain Abdominal tumor		1	Hymenectomy	1200	Vaginal adenositis (5weeks)
CECUTTI A.(1964)[125]	15 years old	Canada	-	Abdominal distention(6weeks) Abdominal discomfort(6weeks)	-	2	Cruciate hymenotomy Prophylactic antibiotics	3000	-
WHITESELL et al.(1963)[126]	14 years old	USA	-	Acute urinary retention(18hours) Cyclic lower abdominal pain(2months)	-	1	Hymenectomy	600	Improved

WHITESELL et al.(1963)[126]	15 years old	USA	-	Lower abdominal enlargement Cyclinc lower abdominal pain(6months) Dysuria(6months)	-	1	Hymenectomy	950	Improved
WHITESELL et al.(1963)[126]	12 years old	USA	-	Acute urinary retention Lower abdominal pain	-	1	Hymenectomy	150	Improved
WHITESELL et al.(1963)[126]	14 years old	USA	-	Back pain(4months) Lower abdominal pain(4months)	-	1	Hymenectomy	1000	Improved
HARPER J.(1961)[127]	13 years old	Canada	-	Abdominal mass Urinary frequency(1month) Lower abdominal pain(2weeks)	-	1	Cruciate hymenotomy Prophylactic antibiotics	3300	Improved
HYATT HW Sr.(1960)[128]	11 years old	USA	-	Cyclic lower abdominal pain(3moths)	-	1	Hymenectomy	325-300	Reclosure of hymen(2W)
HYATT HW Sr.(1960)[128]	14 years old	USA	Hymenotomy for imperforate hymen	Lower abdominal pain Nausea	-	1	Hymenectomy	100	Improved
HYATT HW Sr.(1960)[128]	12 years old	USA	-	Lower abdominal pain	-	2	Hymenectomy	470	Improved
HYATT HW Sr.(1960)[128]	12 years old	USA	-	Abdominal mass Urinary frequency	-	2	Hymenectomy	1150	Improved
ROSENTHAL et al.(1958)[129]	13 years old	USA	-	Abdominal distention(2days) Urinary urgency(2days) Urinary frequency(2days)	-	1	Hymenectomy	700	Improved
ROSENTHAL et al.(1958)[129]	14 years old	USA	-	Lower abdominal pain(6weeks)	-	1	Hymenectomy	800	-
ROSENTHAL et al.(1958)[129]	15 years old	USA	-	Cyclic lower abdominal pain(9months)	-	1	Hymenectomy	-.	Improved
ROSENTHAL et al.(1958)[129]	11 years old	USA	-	Lower abdominal mass Abdominal discomfort(1week)	-	1	Hymenectomy	600	Improved
WARNER et al.(1955)[130]	16 years old	USA	Hymenotomy for imperforate hymen	Abnormal menstruation(3years) Urinary retention(3year)	-	1	Hymenectomy Dilatation of vaginal orifice	-	-
WARNER et al.(1955)[130]	16 years old	USA	-	Primary amenorrhea Cyclical abdominal pain(4years)	-	1	Hymenectomy Laparotomy	400	Improved
WARNER	13 years old	USA	-	-	-	1	Hymenotomy	473	-

et al.(1955) [130]									
WARNER et al.(1955) [130]	15 years old	USA	-	Primary amenorrhea Urinary retention	-	4	Hymenotomy	1000	Reclosure(15 days)
WARNER et al.(1955) [130]	17 years old	USA	-	Lower abdominal pain Abdominal mass Amenorrhea	-	2	Cruciate hymenotomy Antibiotics	1000	Improved
DANIEL WW.(1950)[131]	14 years old	USA	-	Cyclic lower abdominal pain(1year) Headache	-	2	Cruciate hymenotomy	470	Improved
CRIGLER CM.(1946)[132]	19 years old	USA	Menstruation	Scanty of menstruation Dysmenorrhea Dyspareunia	-	1	Surgical correction	-	Destruction of the urethral sphincter and bladder(2years)
Doyle JC.(1942)[133]	10 years old	USA	-	Dysuria(7months) Vaginal fullness	-	-	Hymenectomy	-	Improved
Doyle JC.(1942)[133]	16 years old	USA	-	Primary amenorrhea	-	-	Hymenectomy	-	Improved
Doyle JC.(1942)[133]	14 years old	USA	Previously hymen opened	Amenorrhea	-	-	Hymenotomy	3000	Improved
Doyle JC.(1942)[133]	15 years old	USA	-	Lower abdominal cramps(6months) Back pain(2weeks) Constipation Hot flushes	-	-	hymenectomy	500	-
Doyle JC.(1942)[133]	12 years old	USA	-	Abdominal pain Legs down up Amenorrhea	-	-	Hymenectomy	600-1000	-
Doyle JC.(1942)[133]	12 years old	USA	-	Abdominal pain(2months) Back pain(2months) Legs pain(2months) Constipation(1week) Dysuria(3days) Oliguria(3days)	-	-	Hymenotomy	1000	-
Doyle JC.(1942)[133]	17 years old	USA	-	Lower abdominal pain(1month)	-	-	Hymenectomy	1000	Improved
Doyle JC.(1942)[133]	15 years old	USA	-	Abdominal pain Back pain Abdominal mass Dysuria(3weeks) Frontal headache Hot and cold flushes	-	-	Hymenectomy	800	Amenorrhea (1year)

Doyle JC.(1942)[133]	17 years old	USA	-	Abdominal pain(2weeks) Abdominal distention(2weeks)	-	-	Hymenectomy	750	Developed cicatricial stenosis in upper vagina(8years)
Doyle JC.(1942)[133]	14 years old	USA	-	Lower abdominal pain(5days) Rapid weight gain(10lb/4months)	-	-	Hymenotomy	700	Improved
Doyle JC.(1942)[133]	13 years old	USA	-	Abdominal pain (6weeks) Abdominal distention (6weeks) Back pain	-	-	hymenectomy	800	Improved
Doyle JC.(1942)[133]	13years old	USA	-	Suprapubic pain Frequency, dysuria Nocturia	-	-	Trochar puncture suction	-	-
Doyle JC.(1942)[133]	17 years old	USA	Regular menses from urethra	Incontinence of urine	Urethro-vaginal fistula	-	Hymenectomy Repairing urethrovaginal fistula	-	Improved
Doyle JC.(1942)[133]	2 years old	USA	Hymenotomy 2 time previously for imperforate hymen	Vaginal irritation and tenderness			Hymenectomy	-	Improved
Doyle JC.(1942)[133]	12 years old	USA	-	Abdominal mass(6weeks) Urinary retention	-	-	Hymenotomy	500	Improved
Doyle JC.(1942)[133]	17 years old	USA		Pelvic pressure Amenorrhea	-	-	Hymenectomy	-	-
Doyle JC.(1942)[133]	15 years old	USA	-	Lower abdominal pain Nausea headache Back pain Listless	-	-	Hymenotomy	-	Improved
Doyle JC.(1942)[133]	16 years old	USA	-	-	-	-	Hymenectomy	-	Improved
Doyle JC.(1942)[133]	14 years old	USA	-	Epileptic attacks(2months)	-	-	Hymenotomy	-	Improved
Doyle JC.(1942)[133]	15 years old	USA	-	Crampy pain(18months) Back pain Swelling in introitus	-	-	Hymenotomy	-	Improved
Bingham et al.(1938)[134]	15 years old	USA	-	Amenorrhea Abdominal mass(10months)	-	2	Longitudinal hymenectomy	1500	Improved
McIlroy et	20 years old	UK	Familial history	Amenorrhea	-	1	Hymenectomy	-	Improved

al.(1930)[135]			of imperforate hymen	Abdominal mass Cyclic abdominal pain Frequent urination					
McIlroy et al.(1930)[135]	16 years old	UK	Familial history of imperforate hymen	Cyclic back and abdominal pain(6months)	-	1	Hymenectomy	-	Improved
McIlroy et al.(1930)[135]	14 years old	UK	Familial history of imperforate hymen	Familial history of imperforate hymen Amenorrhea	-	1	Hymenectomy	945	Improved
Roberts.(1873)[136]	20 years old	UK	-	Abdominal mass Dysuria	-	1	Hymenectomy	3000	Improved

Abbreviations: USA; United States of America, UK; United Kingdom, UTI; Urinary tract infection

Supplementary Table S3. List of perinatal case-reported characteristics including presenting symptoms as well as treatment outcomes and comorbidities

Authors (year)	Age(year)/parity	Gestational age at diagnosis (or impression)(week)	Presenting problem	Image modality(prenatal):(predictable) impression or image finding	Combined abnormality	Combined urinary problem(if it was not a presented problem)	Treatment	Amount of drained fluid after treatment(mL)	Outcome
Rodriguez et al.(2017) [137]	31/G2P1	37+3	Fetal abdominal cystic mass	US: fetal abdominal cystic mass with a fluid-debris level posterior to the bladder Postnatal US: Hydrometrocolpos secondary to imperforate hymen MRI: hydrometrocolpos		Left pelvic dilatation Left ureteral distension Poor kidney echogenocity	Hymenectomy	-	Improved
Alici Davutogluet al.(2017)[138]	35/G2P1	32	Fetal ambiguous genitalia	US : hydrocolpos MRI : congenital imperforate hymen with hydrocolpos	-		Hymenotomy	200	Improved
Nakajima et al.(2015)[139]	36/G6P4	28	Fetal Pelvic mass	US : liquid pelvic mass fMRI : imperforate hymen	-	-	Hymenotomy	-	Improved
Ayaz et al.(2011)[140]	19/G1P0	25	Fetal Abdominal cystic mass	US : hypoechoic mass	-	Left pevicailiectasis	Hymenotomy	-	Improved
Dosedla et al.(2011)[141]	39/G5P3	37+1	Cardiotocographic exam. abnormality Growth retardation	US : fetal hydrometrocolpos	Down syndrome	-	Self limited	-	-
Bhargava et al.(2009)[142]	32/G1P0	34	Fetal pelvic mass	US : pelvic mass	-	-	Hymenotomy	-	Improved
Tseng et al.(2008)[143]	32/G1P0	36	Fetal pelvic mass	US : pelvic mass fMRI : congenital imperforate hymen with isolated hydrocolpos	-	Left hydronephrosis	Hymenotomy	80	Improved
Yildirim et al.(2008)[144]	28/G1P0	39	Fetal abdominal cystic mass	US : hydrometrocolpos and imperforate hymen	-	Mild dilated renal pevis	Hymenotomy	-	Improved
Adaletli et al.(2007)[145]	35/G2P1	18	Fetal bilateral hydronephrosis	US : megacystis-microcolon-intestinal hypoperistalsis Syndrome	-	-	Hymenotomy	200	Died(cause:urosepsis)

				fMRI : imperforated hymen with hydrocolpos							
Ogunyemi D.(2001)[146]	27/G4P2	22	Fetal uretocele	US : left ureterocele causing left hydronephrosis, dilation of the left ureter, and bladder outlet obstruction	-	Left hydronephrosis Calyceal dilataion	Cystoscopy endoscopic incision of ureterocele hymenotomy	with the and	-	Assymetric renal function Residual functional dilatation	
Winderl et al.(1995)[147]	25/G1P0	25	Fetal renal abnomaly(echogenic right kidney, multiple pelvic cyst)	US : congenital imperforate hymen with hydrocolpos and a multiple dysplastic right kidney	Right multiple dysplastic kidney	-	Observation	-	-		
Ozturk et al.(2010)[148]	26/-	40	-	US : bilateral hydronephrosis	Polydactyly of both feet and hands Laryngocele	-	Hymenectomy	100	Improved		
Karteris et al.(2010)[149]	32/G3P1	29	Fetal abdominal cystic mass	US : pelvic mass, bilateral hydronephrosis	-	Mild bilateral hydronephrosis Ureteronephrosis	Hymenectomy	200	-		
El-Messidi et al.(2006)[150]	35/G1P0	30	Oligohydramnios	US : bilateral hydronephrosis compressed renal tissue pelvic mass	McKusick-Kaufman syndrome	Bilateral hydronephrosis Large cystic abdominal mass	Hymenectomy	100	Improved		
Posner et al.(2005)[151]	-	28	-	US : pelvic mass	-	-	-	-	-		
Krishna et al.(1998)[152]	-	-	-	US : pelvic mass	-	-	Hymenectomy	200	-		
Jacquemyn et al.(1998)[153]	26/G1P0	29	Fetal disproportionate fundal height Suspicion of polyhydramnios	US : fetal ascites distended uterus&vagina	-	Single umbilical artery Atrial septal defect type 2	Hymenotomy Transabdominal ascites aspiration	-	-		

Abbreviations: US; Ultrasonography, G; Gravida, P; Para

Supplementary Table S4. Summary profiles of case-series reports about IH (not describe detail information of patients)

Author(year)	Age (Median)	Patient's country	Total number	IH	Combined abnormality	Treatment	Outcome
Zhang et al. (2017) [154]	-	China	-	3	Congenital vaginal atresia:	-	Improved
Acar et al.(2007) [155]	13.9±2.1 years	Turkey	65	65	Haematocolpos (100% of all patients)	Central oval incision and Foley catether inserted for balloon dilatation	Improved

Abbreviations: IH; Imperforate hymen

Supplementary Table S5. Combination of treatments for case-reported patients with imperforate hymen

Treatment	Total number of patients (n=236)
	Number of patients (%)
Single kind of therapy	161(68.2%)
Hymenotomy only	73(30.9%)
Hymenectomy only	74(31.4%)
Laparoscopic adhesiolysis only	2(0.8%)
Vaginal orifice dilatation only	2(0.8%)
Observation only	2(0.8%)
Laparotomy only	1(0.4%)
Vaginal septum repair only	1(0.4%)
GnRH agonist only	1(0.4%)
Perforation and dilatation of hymen only	1(0.4%)
Surgical incision of the imperforate hymen only	1(0.4%)
Unknown surgical correction only	1(0.4%)
Trochar puncture suction only	1(0.4%)
Abdominoperineal pull-through only	1(0.4%)
Two kinds of therapy	19(8.1%)
Hymenectomy + Vaginal septum repair	3(1.3%)
Hymenectomy + Laparotomy	2(0.8%)
Hymenectomy + Prophylactic antibiotics	2(0.8%)
Hymenectomy + Vaginoplasty	1(0.4%)
Hymenectomy + Repairing urethrovaginal fistula	1(0.4%)
Hymenectomy + Vaginal orifice dilatation	1(0.4%)
Hymenotomy + Prophylactic antibiotics	4(1.6%)
Hymenotomy + Anal cut back operation	1(0.4%)
Hymenotomy + Laparotomy	1(0.4%)
Hymenotomy + Simple closure of fistula + Extraction of vaginal canal	1(0.4%)
Hymenotomy + Excision of fistula	1(0.4%)
Hymenotomy + Vaginal septum repair	1(0.4%)
Three kinds of therapy	3(1.3%)
Hymenectomy + Hymenotomy + Prophylactic antibiotics	1(0.4%)
Hymenectomy + Removal of calculi in pelvis + Irrigation of vaginal cavity with antibiotic solution	1(0.4%)
Laparotomy + Puncture of the hymen + Bladder suturing	1(0.4%)

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