



Review of Hematometra

Mutarba Altaf Khan, MD¹ and Raed Sayed Ahmed, MD²

¹ Department of Obstetrics & Gynaecology Women's Health Center, International Medical Center Jeddah, Kingdom of Saudi Arabia.

² Department of Obstetrics & Gynaecology, Umm Al Qura University, Makah, Saudi Arabia
mutarbakhan@gmail.com, mutarbakhan@gmail.com

Abstract: This article has been produced to review the literature on symptomatic and asymptomatic cases of Hematometra. **Data sources:** Search engines including The Cochrane Library, PubMed, Google Scholar, Clinical Key were used using the Medical Subject Heading (MeSh) including all keywords and subheadings "Hematometra," "Acute Abdominal Pain and Hematometra" "Cryptomenorrhoea," and "Acute Abdomen and Hematometra". **Methods of study selection:** The majority of evidences in the literature consists of uncontrolled case reports and no review. Out of 1450 studies, only 189 were screened and out of which 132 studies were included in this review. Inclusion criteria was based on the studies done or reported in females in the reproductive age group and females who presented with acute abdominal pain and hematometra. Studies which were reported in animals were excluded. **Integration and Results:** This article reviews epidemiology, etiology, clinical presentation, pathological features, diagnosis, management and outcomes. Dilation with or without curettage is the mainstay of management with medical treatment having no role in management. There are no controlled comparative studies or management guidelines set on hematometra. Only excerpts in textbooks of Obstetrics and Gynaecology describe Hematometra briefly. **Conclusion:** Most crucial feature of treatment is the prevention of recurrence. It is recognized that recurrence is the most common feature and may occur in upto 30 to 66% women after management of adhesions surgically. There are evidences now demonstrating that adhesion barriers are effective in preventing formation of newer adhesions.

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Background

Pathological collection of blood in the uterine cavity is called Hematometra. Obstruction to the outflow tract results in collection of blood inside the body of the uterus.

Obstruction can be partial or complete at any portion of the lower genital reproductive tract. This obstruction may be due to any congenital abnormality causing obstruction at the level of the isthmus of the uterus, cervix or vagina, acquired cervical stenosis secondary to any previous cervical procedure, iatrogenically (dilation and curettage, endometrial ablation) or obstruction by neoplasia.

However, it is very important to differentiate between intrauterine adhesions, asherman's syndrome and intentional intrauterine adhesion that are produced iatrogenically post procedure.

Organic intrauterine adhesions causing secondary amenorrhoea has been demonstrated since the 19th century. And later in 1948, Sir Joseph Asherman described the condition in 29 patients and he related trauma and adhesion formation to menstrual

disturbance, cyclical pelvic pain, and subfertility including recurrent pregnancy loss(1).

However, Hematometra has a wide clinical presentation and due to the complexity of diagnosis and vastness of differential diagnosis, Diagnosis of Hematometra should be kept in mind in any female who presents to the emergency department with acute abdomen and amenorrhoea. Hematometra, if undiagnosed significantly adds to the disease burden of the patient and also adds to additional financial expenses to their medical care (2).

Data Sources

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studies were included in this review. Inclusion criteria was based on the studies done or reported in females in the reproductive age group and females who presented with acute abdominal pain and hematometra. Studies which were reported in animals were excluded.

Epidemiology

The true incidence of hematometra is unknown as it has only been reported as case reports in the literature. The prevalence varies as it is dependent on the availability of investigational modalities for diagnosis and management. The earliest reports that were summarized were in 1939 in a review by Phineas Bernstein and Robert Walter.

Hematometra is only mentioned briefly in textbooks and occasionally referred to in the literature. Therefore, it merits a properly detailed review.

With the increasing number of complex uterine surgical procedures and also the advancing technology in diagnosing, this led to a higher number of reported cases, which may not be the true increase in prevalence.

Etiology

Hematometra is a pathological collection of blood in the uterus causing distension and pain and is secondary to obstruction in the lower genital tract. It is divided into two subgroups: congenital or acquired gynaetresia. In the congenital group, two categories predominate – Imperforate hymen and transverse vaginal septum(3).

Among the acquired causes are atrophy of the endocervical canal, neoplasia of the cervix, scarring of the isthmus, radiation therapy, prior surgical procedures like dilation and curettage, cervical LEEP, cone biopsy, cryocoagulation and electrocautery and incomplete endometrial ablations(4).

Clinical Presentation

In the USA, the most common causes of emergency room visits is Acute abdominal pain(5).

Presentation of hematometra depends on the degree of obstruction – partial or complete. In cases of partial obstruction, it may present as cyclic abdominal pain, uterine distension often appearing as an abdominal mass, uterine enlargement, abnormal uterine bleeding, amenorrhoea, dysmenorrhoea, infertility in premenopausal women and/or can also be asymptomatic in women in postmenopausal age group.

The symptoms of hematometra also depends on the age of the patient, her menstrual history and the rapidity of the accumulation of blood in the uterine cavity(4).

Diagnosis

Due to the diversity of presentation in different age groups and vastness of differential diagnosis, clinical examination alone is not reliable (6, 7). A

thorough history followed other modalities of investigation to visualise the uterine cavity through imaging is helpful in making a definite diagnosis.

Vaginal sounding or cervical probing using a metal dilator helps evacuate the dark old brownish thick blood from the endocervical canal (4). This blood sometimes can become infected and thus produce foul odour and result in secondary infertility (8-10).

Ultrasound

Ultrasonography is most easily available and useful modality in the evaluation of acute abdomen(11). Transvaginal ultrasound (US) is economical, readily available and non-invasive procedure that helps in identifying and diagnosing Hematometra (12).

A large amount of pathologic blood can be collected in the uterus and tubes secondary to obstruction. On a pelvic ultrasound, blood-filled uterus appears as a huge pelvic mass and the endometrial lumen can be seen as echolucent (13). An accompanying anechoic hematosalpinx may also be seen but requires an expert radiologist and a careful examination.

Hematometra has a characteristic endometrial appearance of hyperechoic areas within the uterine cavity. Endometrial echoes at times may be difficult to access and visualise due to irregular thickness and/or interruptions in the lining at the site of collection due to adhesions, fibrosis or obstruction (14).

Echo lucent areas within the endometrium appearing as skip lesions may be due to the preserved functional endometrium causing menstrual bleeding in that area (15).

The sensitivity, specificity, and positive and negative predictive values for transvaginal ultrasound in identifying abnormal uterine cavities were 100%, 96.3%, 91.3%, and 100%, respectively (16).

Three dimensional ultrasound can be more helpful in assessing intrauterine cavity with an added advantage of accessing volume and intrauterine adhesions, with sensitivity reported to be 87%, and specificity of 45% compared with sonohystography in cases of intrauterine adhesions (17).

Hysteroscopy

The widespread use of hysteroscopy and improvement in imaging modalities concentrating on intrauterine pathology and leading to more disease detection may be an important reason for the increasing prevalence.

Hysteroscopy offers a real time view of the uterine cavity that allows for identification of location and extent of the disease Hysteroscopy can also be done in the office with the ability to treat the disease at the same time thus avoiding anaesthesia

complications. Diagnostic hysteroscopy is the gold standard for the diagnosis of Intrauterine lesions and adhesions (18-21).

MRI

When a patient with unknown Mullerian duct anomaly presents to the emergency department with acute abdominal pain, this puts the physician and the patient in a great clinical Dilemma(22).

Because these patients have a uterine duplication and may have an obliterated horn which fills with blood and cause cyclical pain often presenting at puberty. This will appear as a painful cystic mass in the pelvis often mistaken for a degenerating fibroid or an adnexal mass (23)

MRI is helpful in detection and classification of Mullerian Duct Anomalies, thereby guiding towards appropriate management. Many of these congenital genito-urinary anomalies may be initially diagnosed at hysterosalpingography or sonography, but further imaging by MRI is often required for a definitive diagnosis and elaboration of secondary findings. MRI has been used and is known to have accuracy of up to 100% in evaluating Mullerian duct anomalies (24). MR imaging enables clear delineation of internal and external reproductive tract pelvic anatomy (25).

Management

Hematometra is not life threatening, depending how it presents at the time of presentation. Management of hematometra depends on operative relief of the lower tract obstruction.

Management can be expectant or Surgical depending on the presentation.

Patients in the paediatric age group are likely to have Müllerian duct abnormalities that need surgical intervention. Mullerian Duct anomalies and its management is out of the scope of this review article.

Postmenopausal patients who are bleeding and have a fluid collection in the uterus require evaluation of the cervix and endometrium to rule out malignancy. Those with a previous ablation that somehow spared the fundus of the uterus are a challenge and should be evaluated on an individual basis (26-28).

If the patient is symptomatic and presents with acute abdomen and a mass, Hematometra should be kept in mind (22).

There are no randomized controlled trials or Systematic reviews or any guideline to guide us through the management or treatment of Hematometra.

The primary objective of intervention should be to relieve the symptoms and to restore the shape of the distended uterine cavity, cervical canal and the fallopian tubes. Secondary objectives are to treat the cause of hematometra and prevent recurrence.

Expectant Management

To the best of our knowledge, there is no evidence suggesting expectant management as the management of hematometra depends on relieving the obstruction and treating the cause of obstruction.

Pain management should be done and the patient should be stabilized until the cause is known.

Cervical Probing

Intrauterine adhesions have been described by Sir Joseph Ashermann since the beginning of 19th century (29). The pathophysiology of adhesion formation in an organ that undergoes cyclical growth and sloughing is not well understood (30).

In women who presented with cervical stenosis, and had no known risk factor or damage to the uterine cavity or endometrium, cervical probing was the first surgical intervention described by Ashermann then. He describes in his report the return of menstruation in all 29 women in a month after treatment. Mention of cervical adhesions in the literature is very rare in regards to amenorrhoea, severe Intrauterine Adhesions and hematometra (31). However, with our current understanding of pathophysiological findings it is likely that most women in this series had cervical canal scarring with localised adhesions and healthy endometrium.

This technique has a limited role and blind cervical probing can still result in uterine perforation(30).

New approaches to prevent cervical canal adhesions are encouraged, and individual preventive measures should be considered.

Endometrial Biopsy

When the cause of Hematometra is not known, Endometrial Biopsy should be taken in order to rule out any malignancy.

In case if there is a suspicion of infected retained fluid, pyometra, drainage should be done first and Biopsy should be postponed until the infection is resolved and the chances of infection and uterine perforation are diminished(4). In one case report, they described a patient who presented to the emergency department with acute abdomen and hematometra post dilation and curettage for polypectomy and was then successfully managed by a simple pipelle aspiration of old blood in the office thus avoiding any anaesthesia and anaesthesia related complications(7).

Dilation & Curettage

The main stay of management of Hematometra that has been described in textbooks is Dilation with or without curettage. Definitive treatment is based on the cause(3).

It was reported by Schenker in 1982 that Dilation and curettage resulted in return to normal menses in 1049 of 1250 women (84%), conception in 540 of 1052 women (51%), miscarriages in 142 of 559 pregnancies (25%), term delivery in 306 of 559

pregnancies (55%), premature delivery in 50 of 559 pregnancies (9%), and complicated by placenta accreta in 42 of 559 pregnancies (8%). However, the severity of adhesions in this group is presumed to be mild(32).

Dilation of the cervix can be difficult in presence of existing uterine or cervical pathology.

It was reported in one case report that due to presence of a cervical fibroid and acute presentation of a female with abdominal pain and hematometra, attempts at dilation of the cervix failed and hence hysterectomy was performed upon patient's request(2).

In another case report, patient was diagnosed with hematometra and bilateral hematosalpinx secondary to cervical stenosis after a vesicovaginal fistula repair(33). Dilation of the endocervical canal was planned to allow the blood to drain under general anaesthesia but was unsuccessful as the external cervical os could not be visualised. The ultrasonography concluded presence of a lower genital tract occlusion with hematometra and bilateral haemosalpinx secondarily to acquire obstruction. Detailed examination was done under general anaesthesia, dilation of the endocervical canal to allow egress of the collected old menstrual fluid were attempted, but no dimple indicating the external cervical os could be visualized or palpated. Hence, the patient was counselled about explorative laparotomy and the possibility of undergoing abdominal hysterotomy(34).

Nonetheless, it should always be kept in mind that blind dilation and curettage is associated with high risk of uterine perforation, damage to the endometrium and low success rate(15, 18).

Hysteroscopy

Hysteroscopy plays a role in cases which present with Mullerian Duct Anomalies. Mullerian duct anomalies (MDA), although rare, can present in various different ways from infancy to young adulthood. It may present as mucocolpos, pyocolpos, hematocolpos, hematometra, pyometra, primary amenorrhea, pelvic pain, acute abdomen, infertility, or repeated pregnancy loss(6, 35).

Mullerian Duct Anomalies (MDA) are congenital anomalies of the female genital tract that results due to failure of canalisation of the Müllerian ducts in the middle with the urogenital sinus or failed resorption of the uterine septum(36, 37). Lack of fusion of the two Müllerian ducts results in two corpuses and two cervixes(38). Hysteroscopy offers diagnostic as well as therapeutic management at the same time. It enables direct visualisation, magnification and assessment of the entire uterine cavity also enabling lysis of adhesions and septum

resection in cases of presence of mild adhesions or vaginal/ uterine septum(39, 40).

Risks and Complications of the Procedure

Perforation of the uterus is more likely with severe adhesions, cervical stenosis or hugely distended uterus and blind cervical probing. Complications are technique-dependent, generally ranging from 2% to 5% (41). Haemorrhage can occur in 6% to 27% of cases. During hysteroscopy, myometrial blood vessel injury may obstruct the surgeon's view and enable rapid absorption of distention medium, thus causing significant electrolyte disturbances including hyponatremia. Repeated cervical dilation increases the risk of cervical incompetence and complications such as mid-trimester pregnancy loss (42) Because of the high risk of recurrence of adhesions, patients should be counselled about repeat surgery(43), particularly in severe cases(44).

Prevention

Hematometra development is largely idiosyncratic in any woman depending on the cause. However, there are simple principles that may help prevent acquired/ iatrogenic development of intrauterine adhesions resulting in Hematometra.

1. Reduce the need for instrumentation of the pregnant uterus possibly through medical management of miscarriage (45).

2. Use additional ultrasound techniques to differentiate blood clots from retained products of conception, in particular when the uterus has undergone instrumentation already. Use of saline infusion sonohysterography has been reported to be useful (46), as has colour velocity imaging and pulsed Doppler US (47). Such techniques may promote conservative management appropriately and decrease uterine instrumentation thus preventing harm to the endometrial cavity.

3. Perform hysteroscopically guided removal of retained products of conception compared with nonselective blind curettage(48, 49) and When hysteroscopically guided removal of products is not possible, use a suction catheter or blunt curette rather than a sharp instrument(43).

4. Semi-solid barriers such as hyaluronic acid and auto-cross-linked hyaluronic acid gel reduce adhesion reformation (49-52).

Conclusion

Since the literature has abundant case reports and hematometra is only briefly mentioned in textbooks, available data is vast and haphazard and hence requires a proper systemic review, meta-analysis and randomised controlled trials comparing different managements and thus establishing a unified guideline of management.

Recommendation

It is recognized that a universal management system is lacking and needs to develop, which if developed would benefit future research studies, although given the current limitations of any single classification system, this is unlikely to occur in the foreseeable future.

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