Gynecological Emergencies

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Bashar Fahoum · Moshe Schein

Have you ever seen a gynecologist who is convinced that the "acute abdomen" is gynecological in origin, and not due to acute appendicitis?

The famous English writer and physician W. Somerset Maugham (1874–1965) wrote: **"…woman is an animal that micturates once a day, defecates once a week, menstruates once a month, parturates once a year and copulates whenever she has the opportunity…"**. One could not have written such a "sexist" and politically incorrect statement today, but if one could one might have added to it some comment about "lower abdominal pain"…

As a practicing general surgeon you are unlikely ever to deliver a baby but you are likely to face a gynecological problem that you should know how to handle. Acute abdominal pain is very common in women during their reproductive years. Such pain is commonly "gynecological" in origin but is equally likely to be "surgical". Your gynecological colleagues are generally "nice," but typically possess a vision limited by the boundaries of the bony pelvis (› Fig. 31.1). Consequently, they are

Fig. 31.1. "Call the general surgeon!"

often reluctant to diagnose any acute condition as "gynecological" unless you have ruled out acute appendicitis. Occasionally you operate for what you think is acute appendicitis and the findings are "gynecological". You should know how to deal with this. Another situation, which provides you with the pleasure of interacting with gynecologists-obstetricians, is the pregnant patient. As you know, pregnancy itself may be the cause of abdominal pain while at the same time it may modify the presentation of common surgical disorders, making diagnosis difficult. It may also pose considerable challenges in the injured patient.

Acute Abdominal Pain in the Fertile Woman

Assessment and Approach

We do not have to remind you to take a history concerning *menstruation*, *sexual activity* and *contraception*. Pregnancy, whether uterine or *ectopic*, should always be ruled out; this is done in most hospitals with a rapid pregnancy test. Any history of pain that occurs during the first days of the menstrual period, hints at underlying *endometriosis* or *endometrioma* ("chocolate cyst"). Acute pain developing mid-cycle (*mittelschmerz*) may be due to rupture of the Graafian follicle at ovulation. Pain referred to the shoulder raises the possibility of *free intra-peritoneal blood* – irritating the diaphragm – with a likely source of bleeding being *a ruptured ovarian cyst* or an *ectopic pregnancy*.

There is no need to talk to you about physical examination. You surely know that the conditions to be discussed below can produce signs of peritoneal irritation, often indistinguishable from those of acute appendicitis. However, the *site of pain and local findings on examination* are helpful in narrowing the differential diagnosis. When bilateral, consider pelvic inflammatory disease (*PID*); when on the right think about acute appendicitis; when on the left, in an older lady, consider acute diverticulitis (Chap. 3).

Bimanual vaginal examination performed by your gynecological friend, (or by you), is an essential part of the assessment of these patients. You are palpating for masses or fullness at the cul-de-sac (pouch of Douglas) and looking for *excitation tenderness* – when moving the cervix produces a lot of pain (PID, ectopic pregnancy). Your friend hopefully is also armed with a trans-vaginal ultrasound, allowing him (more commonly her) to visualize any free fluid, the uterus and adnexae. When fluid is present in the cul-de-sac, it can be aspirated with a needle through the vagina (*culdocentesis*); when pus is present think about PID or perforated appendicitis, while blood hints at a ruptured cyst or ectopic pregnancy.

Generally speaking, most acutely painful gynecological conditions are treated non-operatively. With all the above information to hand, your job now, together with the gynecologist, is to classify the patient into one of the following groups:

- "Benign" abdominal examination. Most probably a gynecological condition – treat conservatively.
- "Impressive" abdominal examination, no apparent gynecological pathology. This is perhaps the best indication to start with a diagnostic/therapeutic laparoscopy.
- "Not sure". Admit and observe with or without a CT scan (Chaps. 3 and 28).

The most common acute gynecological problems are complicated ovarian cysts, ectopic pregnancy, and PID. You should know how to diagnose each of these conditions, how to treat them conservatively and what to do – if encountered during laparoscopy or laparotomy – when your old gynecological buddy is not around or takes hours to arrive.

Ovarian Cysts

"*Functional*" *cysts* (follicular or corpus luteum) are common and usually asymptomatic. Typical features on trans-vaginal ultrasound include: solitary, no solid components, and size <5 cm. *Acute pain develops when the cyst ruptures or undergoes torsion*. Rupture with minimal local and systemic findings should be treated conservatively. If, however, the rupture results in significant intra-peritoneal hemorrhage and when another pathology cannot be ruled out, laparoscopy or laparotomy is indicated. If there is active bleeding from the cyst, obtain local hemostasis by whichever means. There is no need to aspirate or resect the cyst and please, do not even think of removing the ovary. *Torsion* is usually associated with more severe pain, abdominal findings and systemic manifestations, calling for a laparoscopy or laparotomy. If viable, the tube and ovary can be de-torted and conserved; if non-viable – resect.

Ectopic Pregnancy

The great French surgeon Henri Mondor (1885–1962) said:

> "When in front of an acute abdomen, consider ectopic pregnancy, think always about it, thinking about it again is not enough, and still go on thinking about it."

"Ectopic" means that the fertilized ovum has implanted somewhere outside the usual location (i.e. the body of the uterus). The most common site for ectopic is the tubes but implantation may occur in the ovary, cervix and abdominal cavity. The presentation of these patients varies tremendously, the most common being with abdominal pain and vaginal bleeding. Many women do not even know about the pregnancy, ignoring associated symptoms of pregnancy such as a missed menstrual period. The spectrum of clinical manifestations is similarly wide, ranging from local lower abdominal pain to diffuse peritonitis with hypovolemic shock. The combination of a relevant clinical picture together with a positive pregnancy test, and an empty uterus on ultrasound, confirms the diagnosis.

As a general surgeon you are more likely to be involved with the more dramatic scenario of a ruptured tubal ectopic, which may occur as early as the fouth week of gestation. The sudden development of acute peritonitis and hypovolemic shock will force you to rush to the operating room without the gynecologist. Evacuate the gestational sac, control the bleeding sites with suture-ligatures and preserve the ovary. Less dramatic presentations are usually managed by or in partnership with the gynecologist, often laparoscopically. Note that in most ectopics at operation the bleeding has already stopped; when it is active it may necessitate a simple salpingectomy. When the ovaries are left intact the patient can still undergo *in vitro* fertilization even after bilateral salpingectomies.

Pelvic Inflammatory Disease

PID is an infective syndrome which involves, to a greater or lesser extent, the endometrium, tubes and ovaries. The clinical spectrum of infection is wide, ranging from minimal pain, dyspareunia, fever, and vaginal discharge, associated with mild endometritis/salpingitis, to severe peritonitis and septic shock due to ruptured tubo-ovarian abscess. Likewise, physical findings depend on the disease process and vary from localized abdominal tenderness to generalized tenderness and rebound. Note that the pain and tenderness are commonly *bilateral*. Pelvic examination reveals purulent discharge with cervical motion tenderness. Ovarian or pelvic abscess may be palpated or seen on ultrasound or CT. The majority of "mild cases" should be treated with antibiotics. Outpatient treatment is appropriate for patients who can tolerate oral diet. Patients with severe abdominal and systemic manifestation should be admitted for intravenous antibiotic therapy. Antibiotic treatment is empiric, targeting the common causative organisms, which are, in isolation or combination, *C. trachomatis, N. gonorrhea, E. coli, and H. influenza*. Many oral and intravenous agents are available for you to choose from.

Patients who do not respond to the above regimen or in whom the diagnosis is uncertain are subjected to laparoscopy. This should be left to the gynecologist. The

typical case you will be involved with is the ruptured tubo-ovarian abscess, causing severe pelvic or diffuse peritonitis. During laparotomy or laparoscopy you'll find pus; you read how to deal with peritonitis in Chap. 12. The abscess should be drained; whether to remove the uterus and ovaries depends on the age of the patient, the operative findings and your gynecologist.

When talking about PID, formal textbooks usually mention the *Curtis-Fitz-Hugh syndrome* or "perihepatitis" as a late sequel – ascending from the pelvis. Although originally associated with *gonococcal* infection, nearly all present-day cases are associated with *C. trachomatis* infection. It may produce non-specific abdominal complaints and has been reported to mimic acute cholecystitis, but in our experience it has never represented a specific entity warranting operative measures. We have seen it, however, as an incidental finding of peri-hepatic "piano-string" adhesions at laparoscopy or laparotomy for other conditions.

Acute Abdominal Pain in the Pregnant Women

> "In men nine out of ten abdominal tumors are malignant; in women nine out of ten abdominal swellings are the pregnant uterus." (Rutherford Morrison, 1853–1939)

General Considerations

A consultation about abdominal pain in a pregnant or immediately post-partum woman is frequently an anxiety-provoking experience for the general surgeon. We think that the following few paragraphs will help you to approach these difficult problems with a new understanding and confidence based on some simple concepts. Abdominal emergencies in pregnant women pose a great challenge for the following reasons:

- The ascending uterus gradually distorts the normal abdominal anatomy, displacing organs and thus changing the typical clinical scenario.
- Physiologically, the pregnant woman is different; nausea and vomiting are not uncommon during the first trimester, thereafter, tachycardia, mild elevation of temperature and leukocytosis are considered "normal".
- To a certain degree, abdominal "aches and pains" are common during pregnancy
- When dealing with a sick pregnant women you automatically have two patients; the life and well-being of the fetus have also to be considered.

Generally speaking, acute abdominal conditions during pregnancy are either:

- Specific to pregnancy
- Incidentally developing during pregnancy

Abdominal emergencies specific to pregnancy are either:

- "**Obstetric**" – such as ectopic pregnancy (see above), abortion and septic abortion (a septic uterus may present with an impressive acute abdomen), "red degeneration" of a fibroid, abruptio placenta, rupture of uterus, and pre-eclampsia. These conditions won't be further discussed. Hey, we did not promise you a manual of obstetrics.
- "**General**" – such as acute pyelonephritis, which is more common in pregnant women, or rupture of visceral aneurysm (e.g. splenic artery), which is rare but "typically" occurs during pregnancy. Another condition which may be associated with pregnancy, is *spontaneous hematoma of the rectus abdominis muscle*. (This condition may also develop in non-pregnant men and women, particularly in anticoagulated patients). The hematoma originates from a ruptured branch of the inferior epigastric artery and develops deep to the muscle. On examination a tender abdominal wall mass is often felt; it won't disappear when the patient tenses his or her abdominal wall (Fothergill's sign). Ultrasound or a CT can confirm the diagnosis. Treatment is conservative.

Abdominal Emergencies Randomly Developing During Pregnancy

Any abdominal emergency may occur during pregnancy. Here are a few basic considerations:

- **"Think in trimesters".** During the *first trimester* the fetus is most susceptible to the potential damaging effects of drugs and X-rays. Abdominal operations at this stage may precipitate an abortion. Operations during the *third trimester* are more likely to induce a premature labor, posing additional risk to the mother and fetus. Thus, surgery is best tolerated during the second trimester – if you have the luxury of choice.
- **The well-being of the mother overrides that of the fetus.** If a maternal and fetal distress is present simultaneously on presentation, all therapeutic efforts should be for the benefit of the mother. A Caesarian section is considered only if the fetus is more than 24 weeks old and in persistent distress in spite of maximal therapy to the mother.
- **Pregnant women suffer from a chronic abdominal compartment syndrome** (Chap. 36). The abdominal emergency (e.g., perforated appendicitis or intestinal obstruction) will further increase the intra-abdominal pressure, reducing venous return and cardiac output. Place such patients in *a left lateral decubitus*

position in order to shift the gravid uterus away from the compressed inferior vena cava.

You should be aware of:

- **Acute appendicitis.** You are commonly called to "exclude acute appendicitis" in a pregnant woman. Address the problem as discussed in ◉ Chap. 28, but be aware that as the pregnancy advances, the cecum, with the attached appendix, is displaced higher and laterally – towards the gallbladder. In addition, the appendix shifts progressively beyond the protective, "walling-off" reaches of the omentum – making free perforation more likely. An ultrasound may help in excluding acute cholecystitis. Diagnostic laparoscopy and/or laparoscopic appendectomy during pregnancy have been reported safe to the mother and fetus but still remain somewhat controversial. If you chose to operate, tilt the table to left and places a muscle-splitting incision *directly over the point of maximal tenderness* – wherever it is.
- **Acute cholecystitis.** This is easily recognized clinically and ultrasonographically (◉ Chap. 19) during pregnancy. During the first trimester try conservative management, delaying the operation to the second trimester. If it occurs during the third trimester try to postpone the operation, if possible, until after the delivery. Laparoscopic cholecystectomy appears safe during pregnancy. Inflate the abdomen with the lowest pressure possible and rotate the table well to the left to decrease compression of the IVC (inferior vena cava) by the uterus. When cholecystectomy is required late in pregnancy (when the uterus fills the entire abdominal cavity) we prefer an open approach through a small subcostal incision. This is perhaps the place to mention the *HELLP syndrome* (hemolysis, elevated liver enzymes, and low platelet count). It is a relatively rare syndrome, which may develop in a pre-eclamptic, pre-term, patient and be confused with acute biliary disease (even a "mild" HELLP may stretch the liver capsule producing severe right upper quadrant pain). Liver hemorrhage and hematoma and even liver rupture are serious complications of the HELLP syndrome and represent a surgical emergency; the child should be promptly delivered and the liver managed based on trauma principles. In the unstable, coagulopathic patient the liver should be packed (◉ Chap. 35). Think about HELLP: a misguided cholecystectomy may kill the mother and her offspring.
- **Intestinal obstruction**: *sigmoid* or *cecal volvulus* is more common during late pregnancy. The displacement of abdominal structures during pregnancy may also shift longstanding adhesions, producing small bowel obstruction or volvulus. Pregnancy tends to cloud presenting features and impedes early diagnosis. Notice that a few plain abdominal X-rays, with or without Gastrografin (◉ Chaps. 4 and 21), are entirely safe even in early pregnancy. So if you suspect a large or small bowel obstruction, do not hesitate. Remember that intestinal strangulation threatens the life of the mother and her child.

Trauma in Pregnancy

The management of abdominal trauma in pregnancy is identical to the management in the non-pregnant woman (Chaps. 34 and 35), except that in pregnancy there is concern for two patients – the mother and the fetus. Therefore, assessment of the fetal status either by Doppler or by continuous cardiotocodynamometry is mandatory when the clinical circumstances permit. The major clinical concerns in the injured pregnant female are uterine rupture and abruptio placentae. The former condition is suggested by abdominal tenderness and signs of peritoneal irritation, sometimes in conjunction with palpable fetal parts or inability to palpate the fundus. The latter is suggested by vaginal bleeding and uterine contractions. When the fetus is in jeopardy, a rapid caesarian section is usually in the best interests of both the mother and fetus.

The "Post-partum" Period

Abdominal emergencies are notoriously difficult to diagnose during the early post-partum or post-Caesarian section period. Abdominal pain and gastrointestinal symptoms are commonly attributed to "after pain", and fever or systemic malaise to "residual endometritis". In addition, at this stage the abdominal wall is maximally stretched out and redundant, such that guarding and other peritoneal signs may be missing. "Things move around" the abdomen during delivery and a loop of bowel may be twisted or caught. We have treated perforated acute appendicitis, perforated peptic ulcer and acute cholecystitis during the early post-partum days. Diagnosis is usually delayed and so is the treatment. Be aware!

"Six men give a doctor less to do than one woman." (A Spanish proverb)