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Shiraz E-Medical Journal
Vol. 6, No. 1 & 2, January and April 2005

http://semj.sums.ac.ir/vol6/jan2005/manconf.htm

Management Conference from Department of Internal Medicine: A pregnant lady with abdominal pain

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Abstract:
A 26 years old pregnant lady presented with abdominal pain for 15 days with 3-4 episodes of non-bloody bilious vomiting. She was febrile and had RUQ and LLQ tenderness. Laboratory data showed Anemia with increased nRBC, leukocytosis, thrombocytosis, increased PT. Abdominal paracentesis was cloudy in appearance with WBC: 17620 (seg. =95%), Pr: 3.5 g/dl, SAAG: 0.4. Mesenteric venous thrombosis was identified to be the final diagnosis.

Key Words: Protein, Cholesterol, Sodium, Calcium, Breast Milk, Premature and full-term infants.

Case Presentation:
A 26 years old pregnant lady presented with abdominal pain for 15 days. She was well up to 15 days ago when she developed generalized constant abdominal pain associated with 3-4 episodes of non-bloody bilious vomiting. She was hospitalized in a local hospital for 8 days and finally was transferred to surgical ward with impression of cholecystitis. At that time, she was febrile with RUQ and LLQ tenderness. She received metronidazole, amikacin and ceftizoxime. Obstetric consult revealed no problem with active alive fetus. She was discharged from surgical ward and transferred to medical ward. There was history for chills, fever, pallor and left flank pain but no history of jaundice, diarrhea, vaginal bleeding or discharge. In past medical history, she had an unknown hematologic disease, most probably thalassemia receiving blood transfusion on and off. Splenectomy was done 4 years ago after which there was no need for blood transfusion. She was pregnant with gestation of 26 wks of age, she had one alive child & no abortion. 1

Physical examination and Lab data:
She was well developed, moderately nourished, and no respiratory distress, T: 38° c, Axillary BP: 110/70, PR:120/min regular, RR:20/min . Prominent maxillary bone, pale conjunctiva, mild yellowish discoloration of sclera, dry mouth with glossitis were noted. Breathing sounds were normal. Heart exam revealed normal S1, S2 and a systolic murmur grade II/VI in apex. Gravid abdomen, decreased bowel sound, RUQ and LLQ tenderness, liver span of 12cm and shifting dullness were present. In rectal examination no tenderness, or bloody stool was detected. No vaginal discharge was seen. Neurological exam was

normal. Laboratory data on admission are shown in below tables:

CBC:

Hb	MCV	WBC	seg	lym	Platelate	nRBC
5.4mg	101	29200	72%	27%	515000	60%

Sickle prep: Negative

Chemistry:

BUN	Cr	Na	K	Sugar	LDH	Ca	P	TG	Chol	Amylase	Lipase
8mg/dl	0.4mg/dl	138	4.3	110mg/dl	1500	7.8	3.6	250	156	150	100

LFT:

Total Pro.	Alb	AST	ALT	Total bill.	Direct bill	Alk.phos	PT
3.2g/dl	2.6g/dl	30IU	12IU	0.9mg/dl	0.6mg/dl	635IU/L	20with control:13

Urinalysis:

RBC	WBC	Urobillinogen	Protein	Blood
0-1	0-1	2+	Negative	trace

ABG:

PH	PCO2	HCO3	PO2	O2sat
7.42	23mmHg	15meq	77 mmHg	95%

Pelvic and abdominal sonography showed hepatic congestion, prominent hepatic vein and inferior vena cava, normal thickness gallbladder and active alive fetus.

Differential diagnosis:

The differential diagnosis of acute abdominal pain include all non-obstetric causes as well as causes specific to pregnant women. Multiple factors complicate the diagnosis of acute abdominal pain during pregnancy. First, the differential diagnosis of acute abdominal pain changes as pregnancy progresses. For example, ectopic pregnancy must be considered strongly in the first trimester, but other obstetric causes are more common in the second and third trimesters. Second, anatomic landmarks are shifted by the gravid uterus. Toward the end of gestation, the appendix may be located in the right upper quadrant, often causing confusion between appendicitis and acute cholecystitis. Third, the diagnosis can be delayed by reluctance to perform diagnostic tests during pregnancy, especially tests involving ionizing radiation. The abdominal wall becomes less reactive, probably due to gestational hormones and effects of the enlarging uterus, and the usual diagnostic signs of rebound tenderness, guarding, and rigidity are less commonly elicited. In the early stages, non-obstetric pain is often attributed to obstetric causes, resulting in delayed diagnosis. The combined effects of these factors delay the diagnosis of the acute abdomen in pregnancy to the point where the diagnosis is often made only after the patient is extremely ill[1].

Acute appendicitis: Approximately 1 in 2000 pregnant women developed appendicitis. Appendicitis is the most

common gastrointestinal condition requiring surgery during pregnancy. Symptoms are generally the same as in non-pregnant patients, but the location of abdominal tenderness differs as the enlarging uterus displaces the appendix cephalad. Guarding, rebound tenderness, and fever all appear to be less common in pregnant patients with acute appendicitis. The physiologic leukocytosis of pregnancy reduces the diagnostic utility of this common sign of inflammation. Pyuria and hematuria may be more common, occurring in 10% to 29% of cases, due to the proximity of the appendix to the retroperitoneal ureter.[1]
Local perforation and peritonitis may not be immediately evident, because the uterus can form a medial wall that contains the abscess[1]. Prolonged course of abdominal pain in this woman is not compatible with acute appendicitis except for it complication including appendical abscess which was not found in sonography.

Acute pancreatitis: The incidence of acute pancreatitis in pregnancy is estimated at 1 in 4000 to 12,000 pregnancies. Most cases in pregnancy are associated with cholelithiasis. Other causes of pregnancy-associated acute pancreatitis include hyperparathyroidism and alcoholism. Acute pancreatitis during pregnancy also occurs in the setting of an underlying lipoprotein disorder. Most women have a modest increase in serum triglycerides during the third trimester due to a direct effect of estrogen on liver lipoprotein synthesis and from decreased clearance of triglycerides due to hormone suppression of lipoprotein lipase activity in the liver and adiopose tissues[1]. Normal amylase and lipase in this case is against pancreatitis but more evaluation is needed.

Hepatic rupture: Hepatic rupture is a rare but catastrophic occurrence in pregnancy. It generally occurs in the setting of severe preeclampsia with associated disseminated intravascular coagulation. However, preeclampsia may not be evident in 15% to 20% of cases. Rupture usually occurs close to term or immediately postpartum. Rupture of the liver capsule is thought to result from subcapsular bleeding and can be confirmed by sonography.[1]

Intestinal obstruction: Intestinal obstruction in the pregnant patients occurs in 1 out of 2500 to 3000 pregnancies. Most cases occur in patients who have had a prior operative procedure, most commonly appendectomy or gynecologic surgery, and presumably result from pressure on preexisting adhesions by the enlarging uterus. Obstruction is most common in the third trimester and least common in the first. Symptoms of obstruction are similar to those of the nonpregnant patient.[1] This patient had no obstipation or diarrhea (partial obstruction).

Adnexal torsion: An ovarian cyst in a twisted adnexa can cause an acute abdomen during pregnancy. As with appendicitis, localization of pain may not be classic due to the enlarged uterus.[1] Insidious onset of pain is against this diagnosis in this patient.

Sickle cell anemia: Patients with sickle cell anemia may present with severe abdominal pain during pregnancy but sickle prep was negative.

Ectopic pregnancy: The most common obstetric cause of an acute abdomen in the first trimester is ectopic pregnancy. History, pelivc examination, serum ß-hCG, culdocentesis, sonography, and laparoscopy can all be valuable in establishing the diagnosis.[1] Ectopic pregnancy is not an appropriate diagnosis in this patient with gestational age of 26 weeks.

Abruptio placentae: Abruptio placenta is an important cause of severe abdominal pain during late gestation, occurring in about 8 in 1000 pregnancies. Classically, patients present with pain, uterine irritability and tenderness, and vaginal bleeding. Pain may be unimpressive and bleeding is sequestered behind the placenta in 20% of cases. Ultrasound may confirm the clinical suspicion, but lacks sensitivity and specifity.[1]

Red degeneration of a uterine myoma: Red degeneration of a uterine myoma is caused from a hemorrhagic

infarction of a uterine fibroid. The onset of pain is rapid, localized and severe[2]. [That is not compatible with this patient. Ultrosonography is of great value to document the location, size and consistency of myoma.[2]]

Peptic ulcer disease: Complications of peptic ulcer disease such as perforation, hemorrhage, and obstruction are extremely rare; during pregnancy however, when they occur, they do so late either complications of peptic ulcer disease, such as perforation, hemorrhage, and obstruction, are extremely rare during pregnancy in the third trimester or early in the postpartum period.[1]

Gall bladder disease: Physiologic changes in gallbladder function and bile composition during pregnancy favor gallstone formation. Gallbladder size increases during pregnancy, with no change in common bile duct diameter.[1]

It is unknown whether the frequency of complications of cholelithiasis is increased in pregnant compared to nonpregnant women. However, because cholelithiasis is common in young, healthy women, it is not surprising that complications of cholelithiasis are among the most common nonobstetric gastrointestinal problems seen during pregnancy. Cholecystitis is second only to appendicitis as an indication for surgery in pregnant women. Spontaneous perforation of the gall bladder associated with cholecystitis has been reported. The signs and symptoms of acute cholecystitis are similar to those in nonpregnant patients. As in nonpregnant patients, the diagnosis is based on typical symptoms, laboratory findings, and the presence of gallstones.1 In ultrasonography there was no evidence for stone or cholecystitis. Acalculous cholecystitis may occur but usually presented with localized pain in right upper quadrant.

Pelvic inflammatory disease: Acute pelvic inflammatory disease (PID) is an infectious process resulting from the ascent of cervicovaginal bacteria along the mucosal surfaces of the uterus and fallopian tubes. Patients with PID classically present with the triad of fever, lower abdominal pain, and vaginal discharge. Less acute cases may present with history of continuous lower abdominal discomfort exacerbated by movement and intercourse the presence of fever and vaginal discharge vary. The wide specturm of clinical presentations of PID and the overlap of symptoms with other serious causes of lower abdominal pain make the diagnosis of PID difficult on clinical features.[1]

Mesenteric vein thrombosis: Pregnancy is a hypercoagulability state and is a risk factor for development of mesentric vein thrombosis. [1]

Hospital Course:

The Patient was admitted in internal ward and gentamicin, ampicillin and metronidazole was started. She received 2bag packed cell and hydration. After one day her condition became worse and fetal activity decrease. Pelvic sonography remarked no decreased fetal activity, fetal heart rate, and significant decrease in amount of amniotic fluid. Emergency normal vaginal delivery was done with alive fetus and no evidence for placental abruption or chorioaminits. After delivery, fever continued and she had LLQ tenderness with moderate ascites. New lab. data is reported in below table:

Hb	MCV	WBC	Seg	Lym	Platelet	nRBC	T.P	Alb	AST	ALT	T.B.	D.B
6.7	93	25200	69%	31%	600000	20%	6.7	3.0	34	13	1.4	0.7

Abdominal paracentesis was cloudy in appearance with:
WBC: 17620 Seg: 95% Lym: 4% Mono: 1% RBC: 120 Pr: 3.5
Alb: 2.6 Sug: 65 Amylase:48 LDH:480 SAAG: 0.4 Gram stain: Negative

What dose the result of abdominal tap mean?

The presence of more than 1000 leukocyte, multiple organism, or failure to improve after standard therapy for 48hours suggest that the peritonitis may be secondary to an infection.[3]

The serum- ascites albumin gradient (SAAG) categorizes ascites better than the total protein concentration. If SAAG is greater than or equal to 1.1 gm/dl the patient has portal hypertension, conversely, if SAAG is less than 1.1 gm/dl the patient has peritoneal carcinomatosis, tuberculosis, pancreatic ascites, biliary ascites, nephrotic syndrome, connective tissue disease, bowel obstruction or infarction. Patient with mixed ascites, that is, portal hypertension plus another causes for ascites formation will have a high-albumin gradient. The accuracy of an ascites fluid/total protein greater than or equal to 2.5 gm/dl in detecting exudative ascites has been determined to be only 55.6%. Other criteria for exudative ascites with accuracy of 57% are LDH>1400/L, ascitic fluid/serum (AF/S) total protein ratio greater than 0.5, and an AF/S LDH ratio greater than 0.6. [4]

Abdominal x-ray revealed: abnormal gas pattern especially in transverse colon and localized gas in small bowel with air fluid level, may be bowel wall with paralysis that most probable for peritonitis and evidence of obstruction.

Abdominal CT Scan showed: prominent IVC and congested liver, moderately ascites, increased mesentric fat density, thick bowel loop and dilatation in small bowel. Most indicative for a vascular problem in bowel loop. There is no evidence of pancreatitis, intestinal obstruction, intraabdominal abscess, hematoma and hepatic rupture.

Let's think about mesentenic vascular accident in this patient...

Mesenteric venous thrombosis:

Risk factors for the development of mesenteric venous thrombosis include hypercoagulable states, portal hypertension, abdominal infections, blunt abdominal trauma, pancreatitis, and malignancy in the portal region. Intestinal ischemia following mesenteric venous thrombosis is due to the resistance in mesenteric venous blood flow, which causes profound bowel wall edema, fluid efflux into the bowel lumen with resulting systemic hypotension and an increase in blood viscosity. As a result, arterial flow is diminished, which ultimately leads to submucosal hemorrhage and bowel infarction.[5]

Diagnosis: The diagnosis of acute mesenteric ischemia depends upon a high clinical suspicion, especially in patients with known risk factors (such as atrial fibrillation, congestive heart failure, peripheral vascular disease, or a history of hypercoagulability). Rapid diagnosis is essential to prevent the catastrophic events associated with intestinal infarction. However, early signs and symptoms of mesenteric ischemia are nonspecific, and definite diagnosis often requires invasive testing exposing the patients who typically have several co morbidities to risk. As a result, the diagnosis is often delayed.[5]

Clinical manifestations: Patient with acute mesenteric ischemia have been classically described as having rapid onset of severe periumbilical abdominal pain, which is often out of proportion to findings on physical examination. Nausea and vomiting are also common. Several features of the pain and its presentation may be clues to the underlying diagnosis.[5] Severe pain is more likely with acute mesenteric ischemia involving the small bowel compared with mesenteric ischemia involving the colon, in which extreme pain is usually not as prominent a feature.[5]

* In patients with small bowel obstruction leading to ischemia, pain often precedes vomiting.[5]

* The onset of pain is sudden when ischemia is caused by embolic disease. In contrast, the pain may occur more insidiously (hours to days) in patients with thrombotic causes, vasculitis, or nonocclusive ischemia.[5]

* Lower abdominal pain associated with

hematochezia is more likely with colonic ischemia.[5]

Abdominal examination may be normal initially or reveal only abdominal distension or occult blood in the stool. Signs of peritoneal inflammation, such as rebound tenderness and guarding, are absent. However, as bowel ischemia progresses and transmural bowel infarction develops, the abdomen becomes grossly distended, bowel sounds become absent, and peritoneal signs develop. A feculent odor to the breath may also be appreciated. A subacute, insidious presentation, with symptoms progressing over the course of several days, has also with mesenteric venous thrombosis. A careful general physical examination should be performed to look for signs of an underlying vasculitis.[5]

Laboratory studies and radiological examinations: Laboratory studies are nonspecific. Typical findings include a marked leukocytosis with a predominance of immature white blood cells, an elevated hematocrit consistent with hemoconcentration, and a metabolic acidosis. A useful clinical guideline is that any patient with an acute abdomen and metabolic acidosis has intestinal ischemia until proven otherwise. An elevated amylase, lactic dehydrogenase, creatinine phosphokinase or alkaline phosphatase may be observed as the ischemic insult progresses.[6]

The diagnosis of mesenteric ischemia may also be suggested on several less-invasive tests. Plain abdominal x-rays are relatively nonspecific and may be completely normal in more than 25 percent of patients.5 Suggestive findings include the presence of an ileus with distended loops bowel, wall thickening (particularly prominent in acute mesenteric venous thrombosis), and/or pneumatosis intestinalis. The latter may be observed in patients with advanced ischemia. Intraluminal barium studies are contraindicated since they interfere with visualization on angiography and offer little information. Computerized tumography (CT Scan) of the abdomen may show focal or segmental bowel wall thickening or intestinal pneumatosis with portal vein gas mesenteric arterial occlusions. The accuracy of CT was evaluated in a study comparing CT findings in 39 patients with surgically proven acute mesenteric ischemia, and 24 controls with suspected acute mesenteric ischemia that was disproved at surgery.[7] The finding of either arterial or venous thrombosis, intramural gas, portal venous gas, focal lack of bowel-wall enhancement, liver or splenic infarcts had a sensitivity and specificity of 64 and 92 percent, respectively. In other studies, the sensitivity of CT for the diagnosis of mesenteric venous thrombosis was approximately 90 percent.[8] Diagnosis was made by the failure to opacify the mesenteric veins with intravenous contrast. Relatively less has been published on the accuracy of magnetic resonance angiography in this setting.[9] Initial experience suggests that it may be highly sensitive for the diagnosis of mesenteric venous thrombosis.[10] CT is still usually preferred because of its lower costs and wider availability.

Treatment: Standard initial treatment for acute mesenteric venous thrombosis includes heparin anticoagulation and resection of necrotic bowel. Papaverine administration into the SMA has also been advocated because of concomitant arterial spasm that contributes to the ischemic process. A follow-up laparotomy been recommended to confirm the viability of remaining small bowel. Prevention of recurrent venous thrombosis with warfarin is indicated[11,12]. Low molecular weight heparin may also prove useful, but long-term results are not yet available.

Successful venous thrombolysis with streptokinase, urokinase, and tPA has been reported in a small number of patients. However, additional studies are necessary to demonstrate the safety and efficacy of venous thrombolysis compared to standard therapy. At this time, thrombolysis for SMV thrombosis should be considered experimental.[13,14,15]

She became more toxic and fever continued. Arterial blood gas showed:

PH	PCO2	HCO3	PO2	O2sat
7.32	32.9	16.3	42.5	67%

She was transferred to operation room, finding were bowel gangrene about 20cm in 2 segment, 70cm from ileocecal valve. Microscopic and macroscopic study of resected bowel confirmed necrotic and gangrenous bowel with mesentric vein thrombosis. Final Diagnosis was Mesenteric venous thrombosis.

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