



# The Weekly Probe

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**Hand Clinic Referrals** – a recent message from the Hand Clinic staff at Sydney Hospital asked for a number of instructions to be stressed.

- Make the appropriate appointment as per the Registrars recommendations - The Hand Clinic has recently received a number patients attending the clinic without appointments. Please contact either the Hand Clinic 93827201 or SSEH ED (afterhours) 9382 7111 to schedule appointments, appointments can be made 24hrs a day.
- Please give the fact sheets to patients +/- relatives. However the Hand Clinic acknowledges the information provided by the Hand Registrars may not reflect the instructions above- please explain any significant deviations from the written advice to patients.

**Coastrek** – Kirsty, Jo and Siobhan have entered the Sydney Coastrek and will be trekking for countless hours along the beautiful Sydney coastline on the 4th of March 2016 to raise funds for The Fred Hollows Foundation.

Did you know that 4 out of 5 people who are blind do not need to be (no we are not talking about you Michael E)?

They are trekking to raise funds so that needlessly blind people get the treatment they so desperately need and I would really appreciate your support. <http://www.coastrekfundraising.com.au/KirstyShort>  
You can make a donation via Kirsty's personal page: <http://www.coastrekfundraising.com.au/KirstyShort>

All funds raised will go towards supporting The Fred Hollows Foundation's sight-restoring work to change lives.

## THIS WEEK

<b>Ovarian Torsion</b>
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## OVARIAN TORSION

No we are not celebrating International Year of the Ovary following on from with last weeks discussion of Ovarian Hyperstimulation Syndrome. However as we do see a relatively significant amount of females presenting with lower abdominal pain, ovarian torsion (OT) is a topic worth discussing.

Some studies quote it as the fifth most common gynecologic emergency, affecting females of all ages. Ovarian torsion refers to the twisting of the ovary on its ligamentous supports, often resulting in impedance of its blood supply. Some use the terminology of adnexal torsion (AT) as the torsion may involve the associated ligamentous structures or fallopian tube. As the symptoms are non-specific, OT is difficult to diagnose and requires immediate surgery. The early diagnosis of OT allows the prevention of adnexal loss, which decreases fertility. Failure to establish the diagnosis early may lead to thrombophlebitis and peritonitis, which in turn may cause death. PS

**AETIOLOGY** — Ovarian torsion has been attributed to a variety of aetiologies. Certain of these are more likely in particular age groups, but the anatomic changes that predispose to torsion can occur at all ages. 80 percent of cases occur in females under the age of 50 (reproductive age). The

prevalence of torsion also varies with certain clinical states eg women who are pregnant or undergoing ovarian hyperstimulation during infertility treatment are at increased risk.

Adults – preexisting cysts in 48% neoplasms 46% - larger ovary makes it more likely to tort on its vascular pedicle - 83% of torted ovaries are > 5cm- ~ 6% normal appearing ovaries.

Kids – incidence comparable to that of testicular torsion. Normal ovaries have been demonstrated in over 50 percent of ovarian torsion in children under the age of 15. Thus, it should be recognized that children have a higher risk than adults of torted normal ovaries. Can occur in neonates with prenatally Dx ovarian cysts.

It would be nice if it was the reverse (as it is already difficult to sort out ? appendix ? cyst rupture? Torsion) but it has been found that the right ovary is more likely to tort than the left, suggesting that the sigmoid colon may help to prevent torsion. May be precipitated by recent vigorous activity.

**PATHOGENESIS** — Compromise of the vascular pedicles in the suspensory ligament of the torted ovary impedes lymphatic and venous outflow and arterial inflow. However, similar to testicular torsion, the arterial supply to the ovary is not interrupted to the same degree as the venous drainage since the muscular arteries are less compressible than the thin walled veins. Continued arterial perfusion in the setting of blocked outflow leads to marked ovarian enlargement. Ovarian ischemia then occurs and can result in necrosis, infarction, local haemorrhage, and peritonitis, possibly with systemic infection and inflammation.

**CLINICAL PRESENTATION** — Non-specific and thus challenging to Dx. Think of testicular torsion and its presenting symptoms. The two most common presenting features are pelvic pain, which is usually acute (83 percent) and an adnexal mass (72 percent). It is also common to see associated nausea and/or vomiting. Because of this the mean interval time from pain onset to presentation in one study of kids was 72 hrs in girls (c/w 36 hrs in boys with testicular torsion)

Neonates —feeding intolerance, vomiting, abdominal distension, and fussiness/irritability on background of previously Dx ovarian cysts.

Children and adults — The most common symptom of ovarian torsion is sudden onset lower abdominal pain, often associated with waves of nausea and vomiting. In one series of 87 women with torsion, characteristics and frequency of symptoms were as follows:

- Nausea and vomiting (70 percent)
- Stabbing pain (70 percent)
- Sudden and sharp pain in the lower abdomen (59 percent)
- Pain radiating to the back, flank or groin (51 percent)
- Peritoneal signs (3 percent)
- Fever (<2 percent)

Fever, although an uncommon finding in ovarian torsion, may be a marker of necrosis, particularly in the setting of an increased white blood cell count.

Pregnancy — Torsion in pregnant women presents in a similar fashion with lower abdominal pain, nausea, vomiting, low grade fever, leukocytosis, and possibly with a palpable mass .

**DIAGNOSIS** — A definitive diagnosis of ovarian torsion is based upon surgical findings. The clinical diagnosis should be considered in girls or women with lower abdominal pain, especially in the setting of ovarian cyst/mass- imaging modalities are adjuncts to complete the clinical picture.

Difficult diagnosis to make - correct preoperative diagnosis had been made in ~38% in one study. US is the most useful imaging – identifies adnexal lesions, ovarian enlargement (heterogeneously enlarged), free fluid (non-specific) and normal ovaries are readily identified by pelvic ultrasound.

**However, sonography is less able to determine whether torsion of these structures has occurred** - the presence of normal appearing ovaries does not rule out the diagnosis as normal ovaries can tort. The ability of Doppler ultrasound to distinguish ovarian torsion from other adnexal pathology or normal adnexa is controversial. Diminished or absent ovarian vessel flow on 2D, color, and 3D Doppler ultrasound has been proposed as a sensitive test for ovarian torsion. Absence or impaired ovarian venous flow on Doppler ultrasound was found to have 100 percent sensitivity and 97 percent specificity for a diagnosis of ovarian torsion in a prospective study of 199 women with pelvic pain in the setting of a pelvic pain. In contrast, a retrospective study of 78 women who underwent laparoscopy for presumed torsion reported that abnormal Doppler flow had a sensitivity and specificity of 43 and 92 percent. Remember that venous infarction can result from torsion with maintenance of arterial flow on ultrasound studies. Some experts have not found either the presence or absence of Doppler flow to be diagnostically useful in children.

CT may also show similar ovarian abnormalities that put the ovary at risk of torsion or give a spiral appearance of the adnexal vascular pedicle (6 percent).

Laboratory tests — FBC – can have haemorrhage with subsequent anaemia - ovarian necrosis can cause leukocytosis, and persistent vomiting can lead to electrolyte abnormalities. However, laboratory abnormalities may not be present and, when present, are nondiagnostic.

DDX – ectopic , PID, appendicitis, red necrosis of fibroids (in pregnancy), cyst rupture

Editor: Peter Wyllie

**MANAGEMENT** —The mainstay of treatment is swift operative evaluation to preserve ovarian function and prevent infectious complications. Depends on age of patient, appearance of the ovary etc – detorsion (esp pre-menopausal patients with less than 24-36 hours of symptoms) +/- oopharopexy or (salpingo)oopharectomy. Note that in one study of children the mean time from diagnosis to surgery was 6.3 hrs in girls c/w 2.3 hrs in boys. Subsequently the gonadal salvage rate was 30.3% in boys c/w 14.4% in girls.

**ISOLATED FALLOPIAN TUBE TORSION** — (without ovarian torsion) is a rare, but potential cause of lower abdo pain -risk factors for tubal torsion include tubal pathology (eg, hydrosalpinx, paratubal cyst, neoplasm, tubal ligation device, congenital anomaly), ovarian mass, infection, ectopic pregnancy, altered tubal function (eg, abnormal peristalsis, spasm), or extrinsic lesions (eg, adhesions, endometriosis). Similar presenting symptoms.

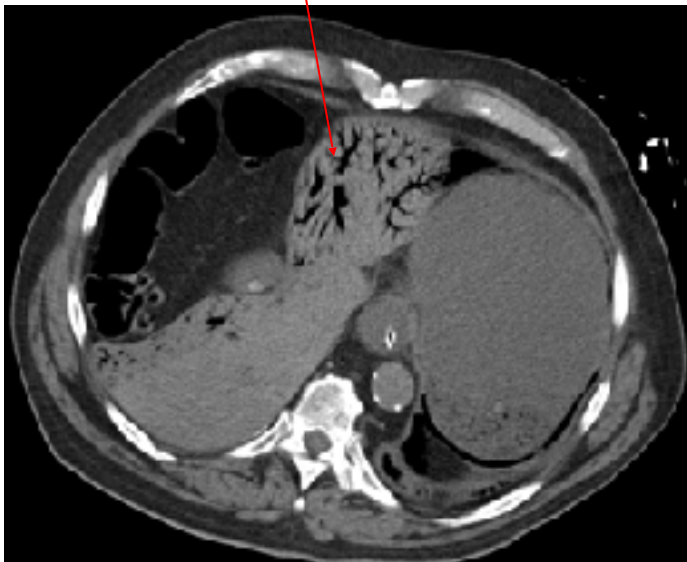
**Take Home points** – Consider ovarian torsion occurs in all age groups esp if prior ovarian masses. Expedient diagnosis of ovarian torsion is important to preserve ovarian function and prevent adverse sequelae (necrosis, infarction, local haemorrhage, peritonitis, systemic infection). However, the diagnosis can be challenging because the symptoms are relatively nonspecific. US - diminished or absent blood flow in the ovarian vessels should lead to a high suspicion of ovarian torsion +/- haemorrhage. However note the ovaries can have a normal appearance and blood flow. Refer early for OT.

Refs- Piper HG Ovarian Torsion: diagnosis of inclusion mandates earlier intervention *J Ped surg* Nov 2012; 47(11): 2071

## MESENTERIC ISCHAEMIA

75yo man presents with vomiting, and apparent shortness of breath on a background of dementia. On exam he has a RR 30 sats 97% 6L afebrile BP 160/95 PR 110 distended abdomen ++ with decreased bowel sounds pH 7.25 pCO2 41 pO2 163 BE -9 HCO3 18 SO2 99% Lactate 9.55

CT showed portal venous air



Mesenteric ischaemia is a “tough” pathology. Early signs and symptoms are nonspecific, and definitive diagnosis often requires invasive testing, exposing the patients who typically have several comorbidities to risk and a result, the diagnosis is often delayed. However rapid diagnosis is essential to prevent the catastrophic events associated with intestinal infarction. As a result mortality is high.

Intestinal ischemia can be divided into acute and chronic (with meal related symptoms with episodic or chronic pain), based upon the rapidity and the degree to which blood flow is compromised.

The four major causes of acute mesenteric ischemia are:

- Arterial occlusion (85-95%)
  - Superior mesenteric artery embolism (50 percent)-especially involving the mid jejunal region - inf mesenteric artery is rarely effected

- Superior mesenteric artery thrombosis (15 to 25 percent)- usually occurs as a superimposed phenomena on a Hx of atherosclerotic Dx associated with advanced age, atherosclerosis, low cardiac output states, cardiac arrhythmias, severe cardiac valvular disease, recent myocardial infarction, and intra-abdominal malignancy – most often at the origin of the vessel

●Nonocclusive ischemia (20-30%)- probably results from splanchnic vasoconstriction or a period of decreased cardiac output / hypoperfusion. Risks include factors associated with hypoperfusion- older pts, heart failure, presence of PVD, hypotension, increased sympathomimetic activity, sepsis, vasopressors etc. Vasoconstriction may persist even after the precipitating cause has been eliminated or corrected.- a more immediate precipitating cause (eg pulmonary oedema, arrhythmia, shock) is frequently present although the consequent mesenteric ischaemia may not become manifest for hours to days.

●Venous occlusion (5%)- includes venous obst'n via hernias etc - tends to occur in younger patients compared with acute mesenteric ischemia due to arterial embolism or thrombosis. Risks include hypercoagulable states, dehydration, portal hypertension, abdominal infections, blunt abdominal trauma, pancreatitis, splenectomy, and malignancy in the portal region.

**CLINICAL MANIFESTATIONS** — The teaching is that those with acute mesenteric ischemia (AMI) have a rapid onset of severe periumbilical abdominal pain, which is often out of proportion to findings on physical examination. Nausea and vomiting is also common. Sudden pain associated with minimal abdominal signs and forceful bowel evacuation in a patient with risk factors for acute mesenteric ischemia should greatly heighten suspicion for the diagnosis.

A couple of caveats:

- Symptoms and signs of mesenteric ischaemia are seen in a variety of pathologies.
- The severity and location of the abdominal pain that accompanies nonocclusive mesenteric ischemia (NOMI) is usually more variable than the classic severe pain of acute occlusive mesenteric ischemia so be suspicious in those with risks. Other symptoms may predominate in those who present with hypotension, congestive heart failure, hypovolemia, and cardiac arrhythmias
- In those with mesenteric vein thrombosis the presentation may be more insidious with pain present for days to weeks (typically 5-14 days) before diagnosis. About ½ have nausea and vomiting.
- Severe pain is more likely with acute small bowel mesenteric ischemia compared with mesenteric ischemia involving the colon, in which extreme pain is usually not as prominent a feature.
- In patients with SBO leading to ischemia, pain often precedes vomiting.
- 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.
- Lower abdominal pain associated with PR bleeding is more likely with colonic ischemia.
- Other differences between small bowel and large bowel ischaemia include:

Colonic	Small bowel
90% > 60yo	Age depends on aetiology
Acute ppt illness is rare	Acute ppt illness is typical
Less commonly appear ill	Pt usually appear ill
Mild abdominal pain with tenderness	Pain severe yet tenderness not prominent early
Rectal bleeding, bloody diarrhoea typical	Bleeding uncommon till late
Colonoscopy is the procedure of choice	CT angiography

Examination - may be normal initially or reveal only abdominal distension or occult blood in the stool yet as ischaemia progresses there may be signs of peritonism (ie this is a late sign). Another tricky part is that mental status changes are seen in 1/3 with acute ischaemia.

**DIAGNOSIS** —This should be based on a high clinical suspicion, especially in patients with known risk factors- note that there are multiple cause and precipitants and that AF is not the only risk factor.

Patients suspected of having acute mesenteric ischaemia should be resuscitated (including measures aimed at relieving acute congestive heart failure and hypotension, correction of hypovolemia and

cardiac arrhythmias), early surgical consultation and consider organising a CT- as noted below this does not exclude mesenteric ischemia but may identify whether it has progressed irreversibly and also helps to exclude other causes of abdominal pain. Direct transfer to OT may be considered in those at risk particularly in the presence of necrosis / peritonism.

**Laboratory studies** — Laboratory studies are nonspecific; while abnormal laboratory values may be helpful in bolstering suspicion for acute mesenteric ischaemia (AMI), normal laboratory values do not exclude AMI and do not justify delaying urgent radiologic evaluation when clinical suspicion for AMI exists.

- Lactate – sensitivities of 77-100%- not specific- more likely to rise once the ischemic insult has progressed to bowel necrosis
- Other findings – non-specific – raised WCC, elevated Hct, elevated amylase and phosphate

#### **Imaging :**

- CT may demonstrate findings consistent with acute ischemia such as focal or segmental bowel wall thickening, intestinal pneumatosis with portal vein gas, bowel dilation, mesenteric stranding, portomesenteric thrombosis, or solid organ infarction, in addition to ruling out other causes of acute abdominal pain. It is suggested that the scan should be performed without oral contrast, which can obscure the mesenteric vessels, obscure bowel wall enhancement, and can lead to a delay of the diagnosis.
- Note that the CT is not 100% sensitive, one study which included 39% of surgically proven ischaemia found the sensitivity of 64%
- Angiography may be considered if the diagnosis remains in question yet in the setting of hypotension or hypovolemia, angiography will demonstrate mesenteric vasoconstriction even in the absence of mesenteric ischemia..
- Note that Plain AXR relatively nonspecific and may be completely normal in more than 25% - may see an ileus with distended loops of bowel, bowel wall thickening (particularly prominent in acute mesenteric venous thrombosis), and/or pneumatosis intestinalis

#### **TREATMENT**

- Resuscitation - aggressive hemodynamic monitoring and support, correction of metabolic abnormalities, initiation of broad spectrum ABs, and placement of a NGT for gastric decompression. Avoid vasoconstrictors if possible. Anticoagulation to prevent thrombus propagation
- Surgery - should not be delayed in patients suspected of having intestinal infarction or perforation based upon clinical, radiographic, or laboratory parameters. Laparotomy, embolectomy / revascularisation and resection of ischaemic bowel may be required.
- Interventional radiology – may be considered if contraindications to OT, if early with no evidence of necrosis – direct infusion of thrombolytics or vasodilators- stenting may be considered
- Anticoagulation-esp for mesenteric vv thrombosis

**Prognosis** - depends on the age of the patient, comorbidities, complications , time to diagnosis (less than 12–24 hours and before gangrene), extent of ischaemia and the underlying cause:

- venous thrombosis - 32% mortality
- arterial embolism - 54% mortality
- arterial thrombosis - 77% mortality
- non-occlusive ischemia - 73% mortality

#### **What to do with the patient?**

Not surprisingly the patient continued to deteriorate and not surprisingly arrested ~ 4 hrs post presentation.

Refs – Schofield N, Acute mesenteric ischaemia *J Internsive Care society* July 2014;15(3):226 / auntminnie.com / Radiopaedia / Uptodate)

### **NEXT WEEK'S CASE**

A 67yo woman presents after an out of hospital cardiac arrest preceded by 2 days of epigastric pain treated with PPIs. The autopsy showed evidence of myocardial infarction secondary to 60-70% atherosclerotic narrowing of 2 coronaries the thrombotic occlusion of her LAD.

What differences do we see with men and women in terms of chest pain and coronary artery disease?

## JOKE / QUOTE OF THE WEEK

One from the SMH and Lahi..

A gynecologist becomes so fed up to the backteeth with malpractice insurance and all the rest, he embarks on a career change, where his already skilful hands could still be of use. He goes to the local technical college, and takes evening classes to become a mechanic. When the time of the practical exam approaches, the gynecologist prepares carefully for weeks, and completes the exam with tremendous skill.

When the results came back, he is surprised to find that he has obtained a score of 150%. Fearing an error, he calls the Instructor, saying, "I don't want to appear ungrateful for such an outstanding result, but I wonder if there is an error in the grade?"

"No, the instructor says, "During the exam, you took the engine apart perfectly, which was worth 50% of the total mark. You put the engine back together again perfectly, which is also worth 50% of the mark."

After a pause, the instructor adds, "I gave you an extra 50% because, before this, I've never seen it all done through the exhaust pipe."

Please forward any funny and litigious quotes you may hear on the floor (happy to publish names if you want)

### THE WEEK AHEAD

*Tuesdays - 12:00 – 13:45 Intern teaching -Thomas & Rachel Moore*

*Wednesday 0800-0900 Critical Care Journal Club. ICU Conf Room / 12.00-1.15 Resident MO in Thomas & Rachel Moore*

*Thursday 0730-0800 Trauma Audit. Education Centre / 0800-0830 MET Review Education centre / 1300-1400 Medical Grand Rounds. Auditorium.*