

Please Read Carefully !!

A Case Presentation



Amir Morgan
Consultant Colorectal
Ipswich Hospital

Case Summery

- A 33 Y , Male
- Very Fit & Healthy
- Practice Water Sports, Jogging, Football
- Got Admitted to NNUH in 3 different occasions:
 - Once Elective &
 - Twice for emergency Reasons

ADDRESS FOR REPORT: GASTRO UNIT

HISTOPATHOLOGY REPORT

LAB No: 06S25846

CAT

CASE HISTORY:

Iron deficiency anaemia. 1 cm caecal polyp at ileocaecal valve. ? adenomatous.

MACROSCOPIC:

Cellsafe.

MICROSCOPY:

Large intestinal mucosal biopsies showing elongated crypts and fairly diffuse moderate to severe lamina propria chronic inflammation. No crypt abscess or granuloma formation is recognised. There is no evidence of dysplasia or malignancy.

DIAGNOSIS:

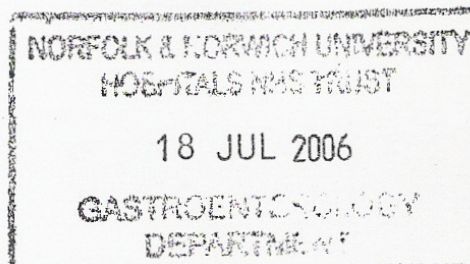
CAECAL POLYP BIOPSIES.

REPORTED BY:

Dr. V. R. Sams, Consultant Histopathologist.

REPORT DATE:

13.07.2006



HISTOPATHOLOGY REPORT

LAB No: 07S06915

MN

07 MAR 2007

CASE HISTORY:

Anaemia. Investigation: abnormality at ileocaecal valve on colonoscopy. Capsule enteroscopy revealed ? angiodysplasia. Operation findings -?Crohn's. Three strictures identified in terminal ileum. Ileocaecal resection.

MACROSCOPIC:

Ileocaecal resection the ileum of which measures 21 cm and the included colon of which measures 6 cm in length. The serosal surface of the ileum shows focal fat wrapping. On opening the ileum three strictures are seen; the most prominent 2 cm from the ileal resection margin. The second stricture is located 4 cm distal to the first area, and the third stricture is located 3 cm distal to the second area.

A = the most proximal stricture including part of the proximal resection margin. B = area between first and second stricture. C = second stricture. D = area between 2nd and 3rd stricture. E & F = 3rd stricture. G = appendix. H = caecum. I & J = mesenteric nodes. CP/SJD

MICROSCOPY:

The areas of ileal stricture show acute ulceration with associated acute and chronic transmural inflammation with submucosal, intramuscular and subserosal granulomatous inflammation and insipient fissuring type ulceration (E). No dysplasia or malignancy is seen. There is distorted but probable serosal granulomatous inflammation at the ileal surgical margin (A) along with focally active mucosal inflammation at this level also.

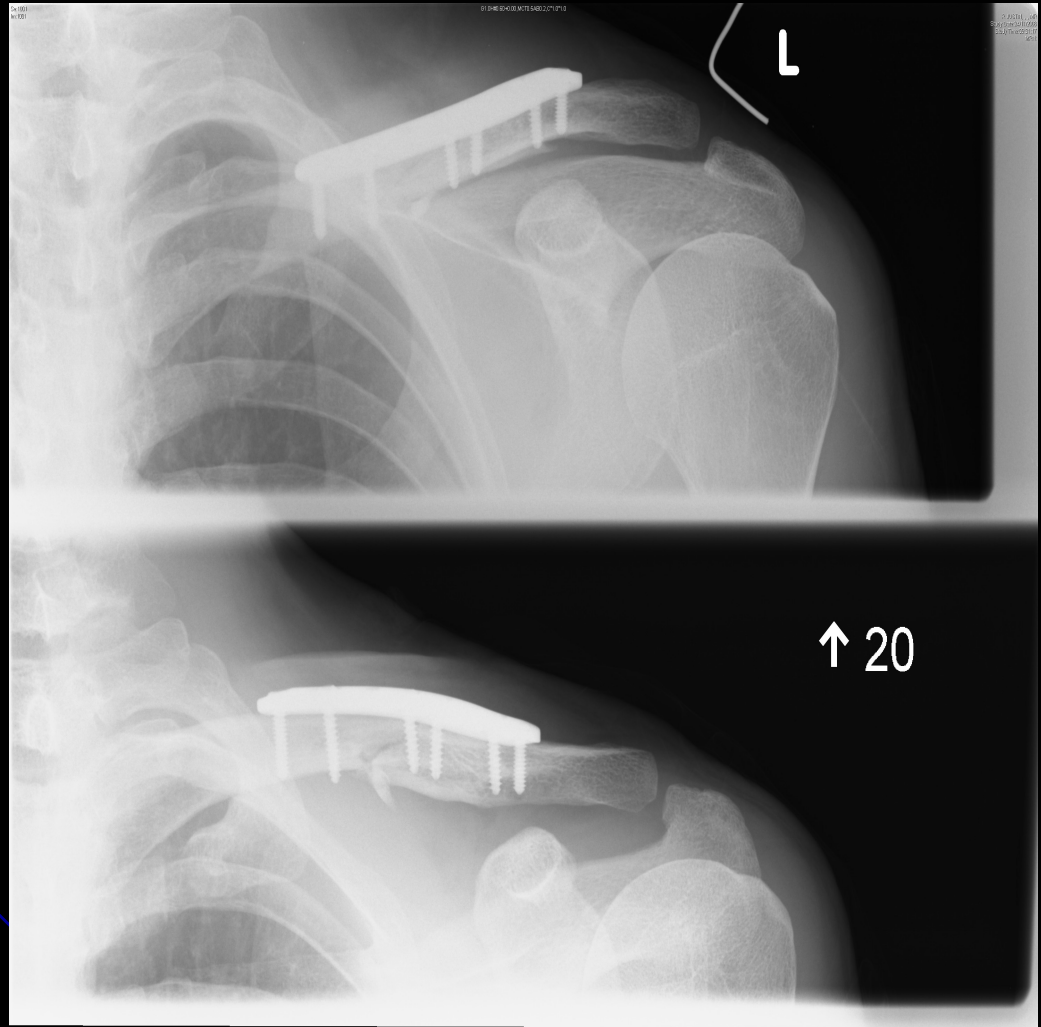
Serosal granulomas are also seen on the surface of the sampled unstricted bowel (B). The sampled large bowel shows submucosal lymphoid aggregates with loose granulomas within them. However, no acute ulceration is seen.

The appendix shows focally active chronic inflammation but no unequivocal granulomas are recognised.

The mesenteric lymph nodes show granulomatous inflammation with loose epithelioid cell granulomas.

DIAGNOSIS:

ILEOCAECAL RESECTION: CROHN'S DISEASE (SEE ABOVE).



CULT	ALC	ABG	Other			Saved in A&E		
Urine: LEU -ve	NIT -ve	PRO +	pH 6	BLD Neg	KET +2	GLUC	Preg Test	MSU sent
XRAY Site:						CT Site:		
Social: Independent Lives Alone		With Spouse/ Partner/ Family		Nursing/Residential Home		Sheltered/Warden Home with Care		
Home Care		x per day x per week		Mobility: Independent		Sticks	Frame	Immobile
Other Social Care e.g. CPN, Social Worker, Other								
Property: Kept by Patient Bagged & Labelled		Given to Relative (Signature of Relative)		Hospital Safe Property Book No		Valuables Left on Deceased Patient (list)		
Medications with Patient for Transfer to Ward/Discharge? Yes No								

Medical/Nursing Notes
Please sign, date and time ALL entries

Date & Time	Notes
11/8/09	CA, clo abdo pain - known Crohn's disease
06.10 - (Tuesday)	Went body surfing on Friday and afterwards began having pain in upper abdomen and has not had bowels open since.
	- Saw Dr in A+E in minehead, given analgesia and told nothing acute. Pain ↑ tonight has still not had bowels open - very concerned.

CA/Inman

CLINICAL NOTES

DATE & TIME

Please time and sign all entries

VINHAM
0708
22/8/19

36yrs ♂

Background: Colitis disease

colorectal resection for shingles 21/2/17
Mr Speakman.

- Problem
- ① Abdo pain
 - ② BNO
 - ③ vomiting

BNO since Friday morning

passing scant wind - clams x 3 since Friday

vomiting 3-4 x day - food stuffs ° brown fluid ° blood

Abdo pain

- lower abdominal
- crampy initially
- partially relieved paracetamol + ibuprofen
- now more constant ache

PMH: # claudicatio plaud.
abore

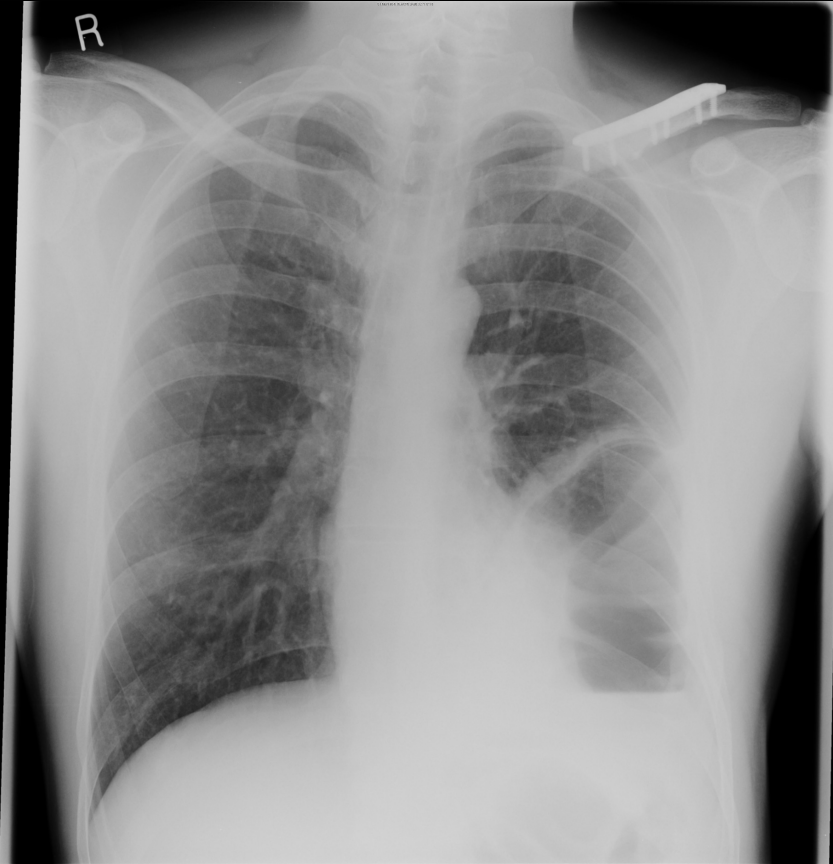
Rx: Pentasa 500mg BD

SH: ex-smoker
occasional alcohol
working

O/E: Afebrile

WS: P 90
BP 132/110/4
HS 1+1+0

at 20p) SpO₂ 98% air
b/l air edy
° added





R. Jones, J. Smith

Male

Reg. No. _____

Hospital Number: 0674879

NHS Number: 428 931 7731

Sheet _____

Date of Birth:

Minehead A+E referral (on SATURDAY), self-referral.

11/06/09

(36), Maintenance Engineer

Δ Crohn's Disease
SB resection - Mr Speakman
2007.

09:30am

PC: abdominal pain

HPC: - 5/7 hrs of acute ^{crampy} abdo pain, severity (8/10), no radiation

- Loss of appetite, Last night Sun evening

- Some relief of pain with pain killers

- Vomiting - Saturday, several times, no blood

- Intermittent pains (few secs); but come up
v. frequently

- Now constant pain since yesterday pm

- Bowels not opened since Friday morning

Normally Bowels regular opening (1-2)

- Passed wind (x3 since Friday)

- No chills, fever, shakes.

PMH: Crohn's Disease 2006 Dx

Small Resection 250ml 2007 Dx

No other
medical
problems

Follow up (once a year)

(L) shoulder pain - due to plate on previous RTA
has had plate.

Meds

Pentasa 9 500mg (2 @ night, 2 @ morning)

NKDA.

SH

non smoker

occasional drinker

Patient's Name J [redacted] [redacted]

Reg. No. _____
Sheet _____

DATE
13/8/9
13:30

WR Dr Jamieson

Hx noted.
Known Crohn's.
Ileocaecal resection 2 years ago.
CRP 50.

Admitted unwell, vomiting, BNP
Δ difficult to tell whether
active Crohn's

pt getting better

① Consider small bowel
imaging as OP

[Signature] 0117



14/8/09 WR DR McLENNAN, DR ALAN
8:30am Pr feeling much better
been drinking well, ~~scrap jelly +~~ ~~meat~~ & milk
passing lot of wind, No sickness

obs afebrile, stable

plan pr wants to go home
↑ food intake
R/V with MR MATTHEWS

[Signature]
McLENNAN
FY1
020

DATE & TIME

CLINICAL NOTES

Please time and sign all entries

099

Mrs Mitchell, A+E cam

10.40

15/10/9

PC/HPC

Chronic disease pt previous season
 admitted Tues - Fri^{18/9} had week with
 subacute SOB, treated conservatively w/ NG tube
 + NBM. Settled after 7/7, now perusing
 wind + loose stools x 2 since hospital
 D/C yesterday

Yesterday pm, feeling a little tight chest
 all day @ chest

SOB became increasingly SOB. No
 broad chest pain, but @ chest discomfort
 + tight chest

Never had this before. Not like
 childhood asthma.

Or has helped a little, but still v.
 SOB, + worse only lying down.

PMM

child hood asthma now resolved

Crohn's disease - not active

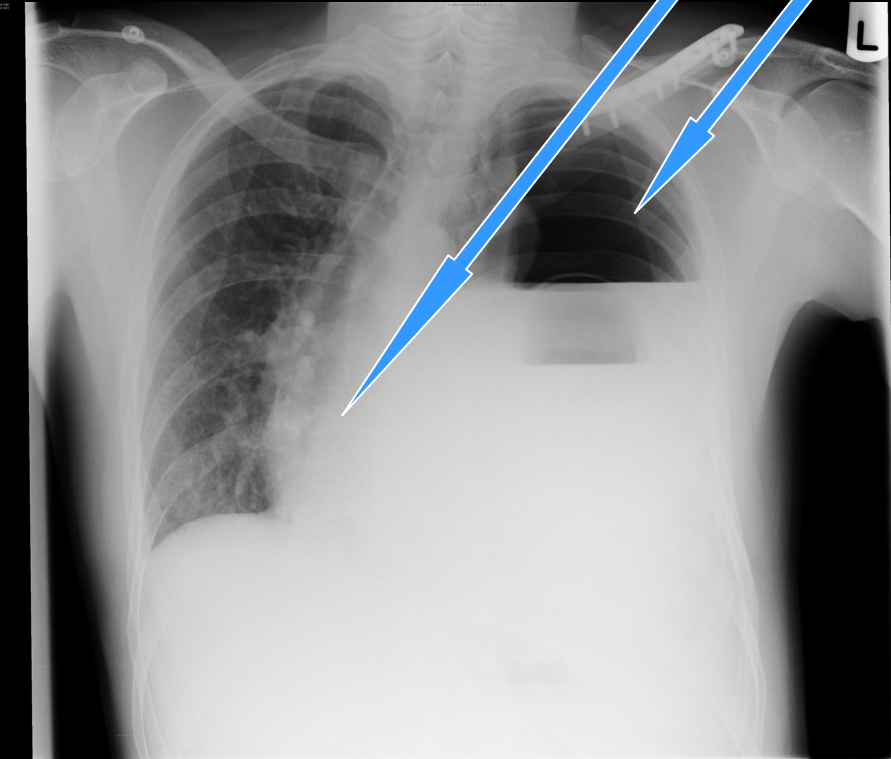
DM° HD° Epilepsy° Asthma

Diagnosed

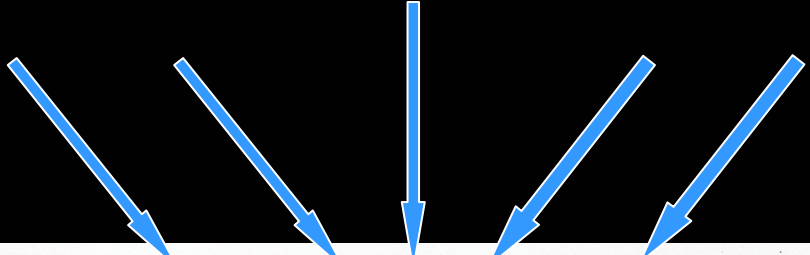
allergic air known

C/E SOB at rest, subacute

v. poor air entry @ base



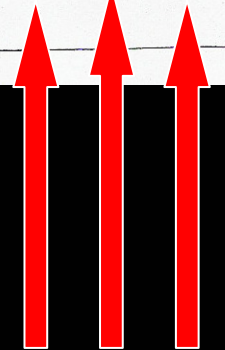
DATE & TIME	CLINICAL NOTES
	Please time and sign all entries
	On-call Surg. Res: A Messer
	36 Admitted 2 days, 21 Small bowel obstruction was cleared and sent home
	Got very distressed early morning pain to cardi! x-ray → Hydro-pneumothorax.
	Going back in history: had a trauma to side of chest while board skating in sea last Friday.
	Very difficult but the x-ray on previous admission: Lt Pl. effusion

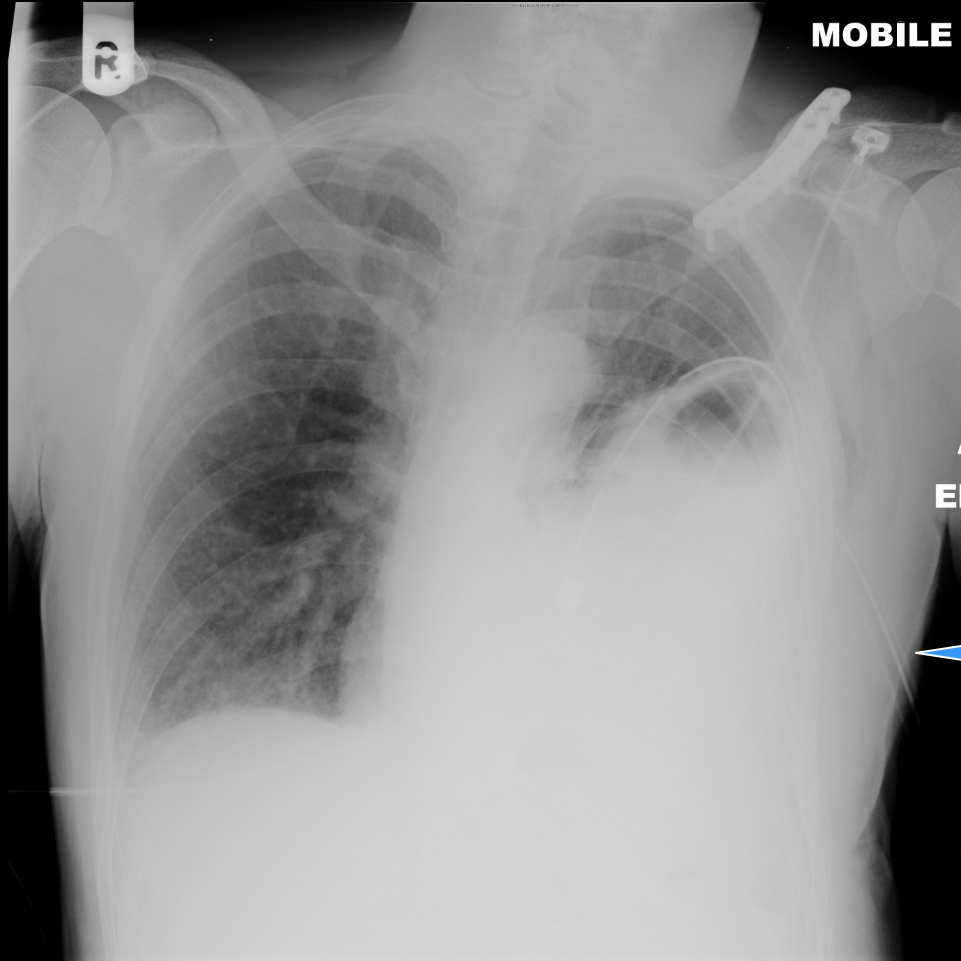


(Impr.) . Could be a Diaphragmatic Rupture.
Started as a minor tear that gradually
worsened till next ptch approx.

(P) DW Radiology Req → Agreed to
perh CT Chest's approx Absc
then probably Cardithic Rupt.

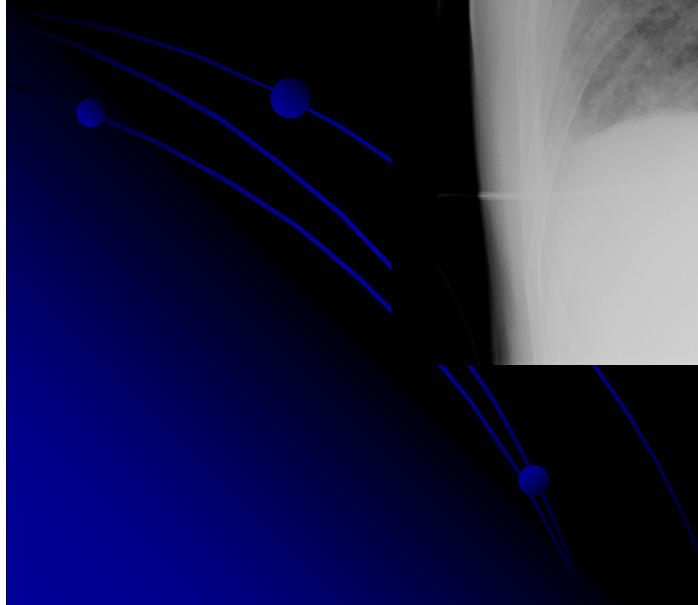
(P.S.) Pleum and chest drain ~~AAR~~
until we get the CT





MOBILE

**AP
ERECT**



CT Chest 15.08.09

Findings: there is the chest drain on the LEFT chest. There is now minimal pleural gas and the fluid in the pleural space has largely been drained. There there is subcutaneous emphysema. there is consolidation and largely collapse of the LEFT lower lobe. There is some consolidation and collapse of the LEFT lower lobe. There is evidence of diaphragmatic rupture with a loop of dilated splenic flexure passing into the hernia. There is some thickening of the bowel wall. No other bowel is seen within the hernia. There is no dilated bowel within the abdomen. There is a little fluid in the pelvis. There are some small bowel sutures in the RIGHT iliac fossa which reflect, I understand, a history of Crohn's disease. No bony injury is seen. The liver, spleen, kidneys, pancreas and adrenal glands are unremarkable.

Conclusion: the appearances are consistent with a loop of splenic flexure within an LEFT diaphragmatic hernia with thickening of the bowel wall.

Report Author : PNM, DR P MALCOLM

Creation Date : 2009.08.15
Creation Time : 14:01:38.0000

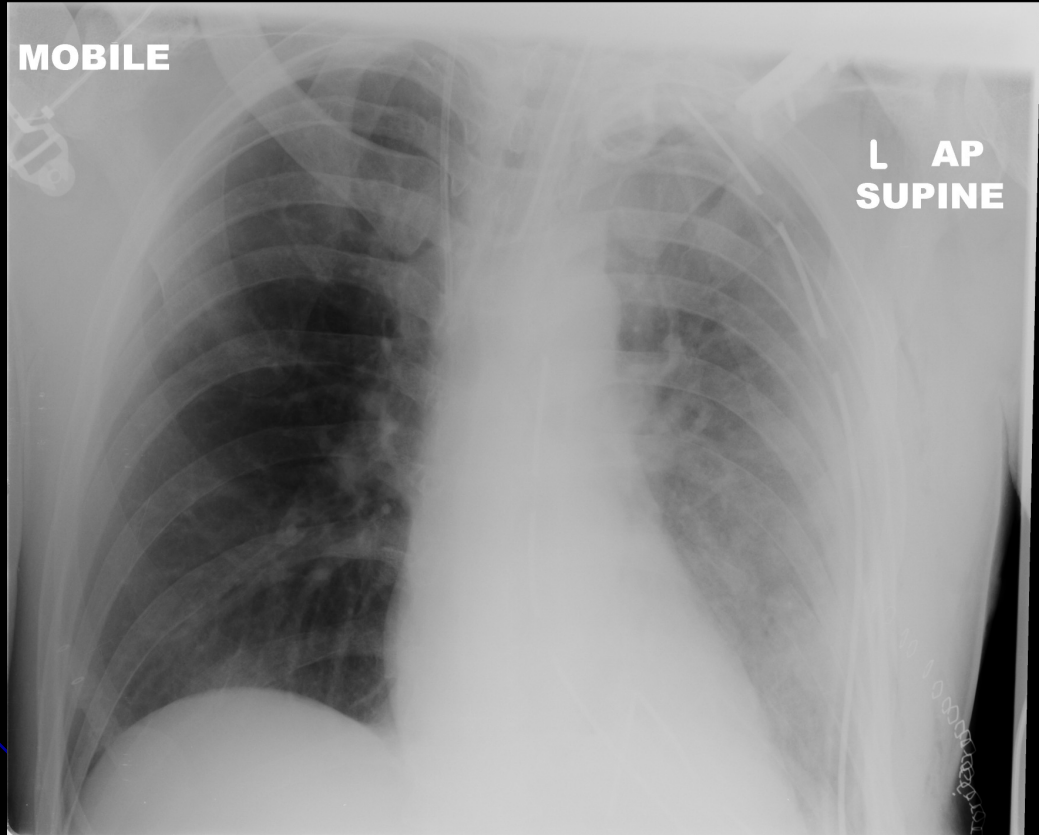
Approved by : PNM, DR P MALCOLM

Approval Date : 2009.08.15
Approval Time : 15:47:00.0000

THIS REPORT WAS RECEIVED FROM TC-Rad RIS System

=====REPC

Patient Name : RICHES, JUSTIN MR
Patient ID : 0674879
Birth Date : 1973.02.17



DATE
24/08

WR SpR Hindmarsh

8am

Pt well. Drains out.
Obs stable, afebrile.
Abdo wand clean.

1) If < 50ml in stoma, pt can go home.

2) Abdo returns out 25/08

JUSTIN RICHES GISS

U+E

Na 136

K 4.3

U 2.8

Cr 54

CRP 201(=)

LFE (=>)

Bil 5

Alb 17

Glob 36

Prot 52

ALT 27

ALP 166

GFT 84

FBC

WCC 13.7

Neut 12.11(=)

Plt 571

Hb 10.7

221

[Signature]
0205 (02)

25/08/09

WR Mr Hindmarsh

7.55

Patient well

Stoma: 805

Obs stable
Afebrile

Plan:

1) Remove sutures/staples

2) Reuse

3) R/V in clinic in 6-8/52

[Signature]
HARRINGTON (F1)

Have a Look at that :

Radiological Report : Clinical Information:

Acute abdominal pain, chrons disease, small bowel resection

Any signs of perforation

Report:

Repared with Dr. S Williams (Consultant Radiologist)

Lungs and pleural spaces clear. Elevated contour of the left hemidiaphragm and splenic flexure of the colon. This is new relative to the CT fo 2006. Note of a left clavicular fracture (Oct 2008) and a subsequent vertebral compression fracture in Feb 2009. Did the patient have significant trauma at htat time? This could represent a diaphragmatic rupture or paralysis.

Report Author : SDR, DR SHEVANTHA DILSHAN ROSA

Creation Date : 2009.08.14
Creation Time : 11:40:31.0000

Approved by : SDR, DR SHEVANTHA DILSHAN ROSA

Approval Date : 2009.08.14
Approval Time : 14:46:00.0000

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Lessons To Learn

- Take a **good History**
- **Read** Old Notes Carefully
- **Communicate** with other members of Team. **especially Radiology Teams**
- **Do not** request investigations **then forget about it**
- Discuss with **senior team** the discharge plans
- **Consider** all aspects of management
- **Always Record** your Name & Time of review clearly

Diaphragmatic Hernia

- 2 categories:
 - **Congenital:**
 - Embryologic defects in the diaphragm
 - Present **early** rather than late in life
 - However, a subset of **adults may present** with a congenital hernia that was undetected during childhood
 - **Acquired:**
 - **All** types of trauma,
 - With **blunt forces** accounting for the majority.

History of Procedure

- The **first** traumatic diaphragmatic hernia was reported by **Sennertus in 1541**
- The **first two deaths** were described by **Ambrose Paré in 1578**, one from strangulated bowel.

-
- Blaivas M, Brannam L, Hawkins M, Lyon M, Sriram K. Bedside emergency ultrasonographic diagnosis of diaphragmatic rupture in blunt abdominal trauma. *Am J Emerg Med.* Nov 2004;22(7):601-4. [[Medline](#)]

Problem

- Require a **high level** of suspicion to detect
- Patients can be **asymptomatic** :
 - **53%** of hernias from **blunt trauma**
 - **44%** from **penetrating trauma**
- **Routine chest x-ray** detects only **33%** of hernias when interpreted by the trauma team leader at initial evaluation
- **Missed injuries are associated** with **significant morbidity and mortality.**

-
- Hanna WC, Ferri LE, Fata P, Razek T, Mulder DS. The current status of traumatic diaphragmatic injury: lessons learned from 105 patients over 13 years. *Ann Thorac Surg.* Mar 2008;85(3):1044-1048. [[Medline](#)]

Frequency

- Of patients admitted to the hospital for trauma, **3-5%** have a **diaphragmatic hernia**
- The **male-to-female ratio** is **4:1**
- **Most presenting** in the **third** decade of life
- Approximately **0.8-1.6%** of patients with blunt trauma sustain a rupture of the diaphragm
- Approximately:
 - **69%** of hernias are **left-sided**,
 - **24%** are **right-sided**, [Hepatic protection]
 - **15%** are **bilateral**
 - Children have **equal rates** of rupture per side, likely due to **laxity of liver attachments**

-
- Turhan K, Makay O, Cakan A, Samancilar O, Firat O, Icoz G, et al. Traumatic diaphragmatic rupture: look to see. *Eur J Cardiothorac Surg*. Jun 2008;33(6):1082-5. [[Medline](#)]
 - Cameron JL. Diaphragmatic injury. In: *Current Surgical Therapy*. 9th ed. Philadelphia, PA: Mosby-Elsevier; 2008:975-987
 - Mansour KA. Trauma to the diaphragm. *Chest Surg Clin N Am*. May 1997;7(2):373-83. [[Medline](#)].

Presentation

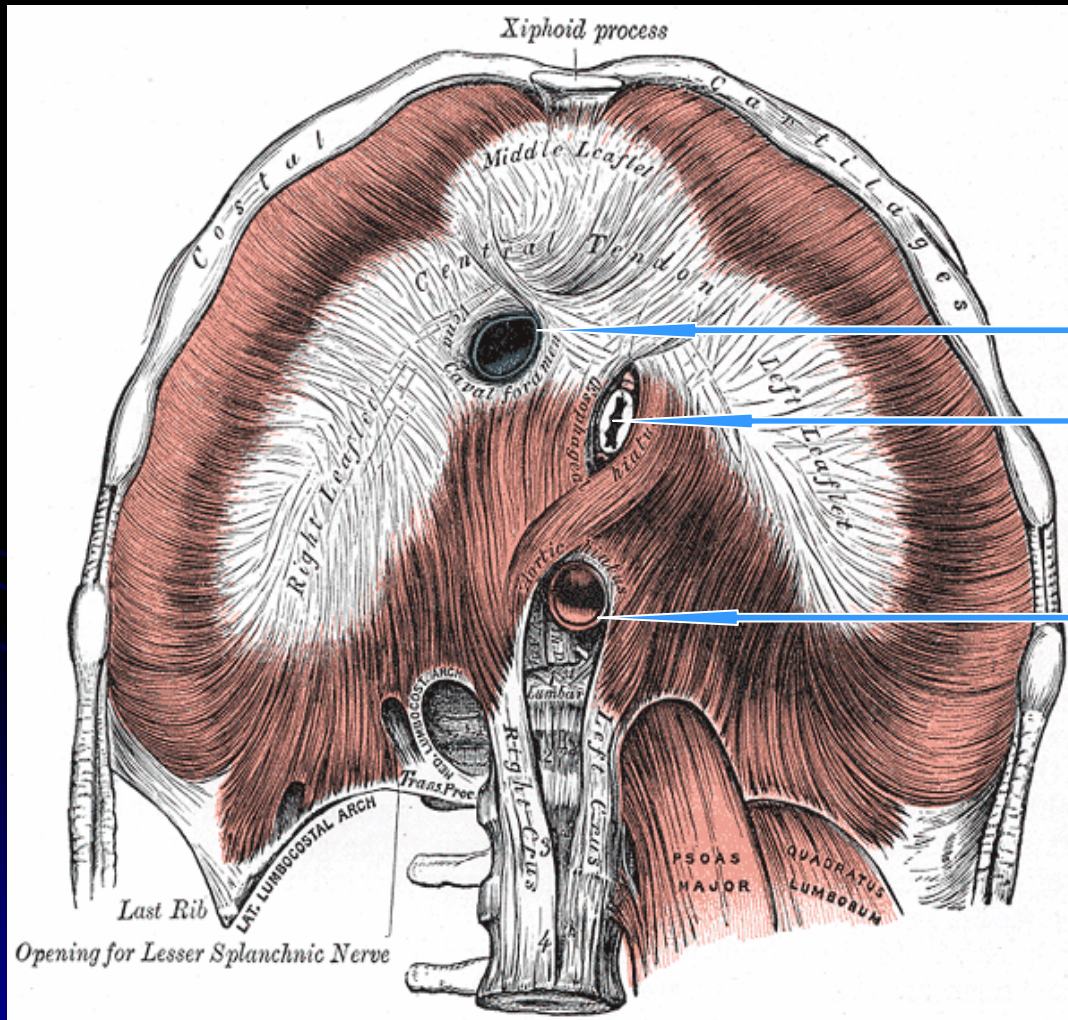
- **Clinical findings include:**
 1. Marked **respiratory distress**,
 2. **Decreased breath sounds** on the affected side,
 3. **Palpation of abdominal contents upon insertion of a chest tube,**
 4. Auscultation of **bowel sounds** in the chest
 5. **Paradoxical movement** of the abdomen with breathing
 6. **Diffuse abdominal pain.**

Etiology

- most common is either:
 - **Blunt:**
 - Motor vehicle accidents are the leading cause
 - **Penetrating:**
 - Gunshot or stab wounds
- Other rare causes include:
 - **Labor** in women with **prior diaphragmatic hernia repair**
 - **Barotrauma during underwater** dives in patients with history of Nissen funduplications

-
- Hamoudi D, Bouderkha MA, Benissa N, Harti A. Diaphragmatic rupture during labor. *Int J Obstet Anesth.* Oct 2004;13(4):284-6. [[Medline](#)].
 - Hayden JD, Davies JB, Martin IG. Diaphragmatic rupture resulting from gastrointestinal barotrauma in a scuba diver. *Br J Sports Med.* Mar 1998;32(1):75-6. [[Medline](#)].

Relevant Anatomy

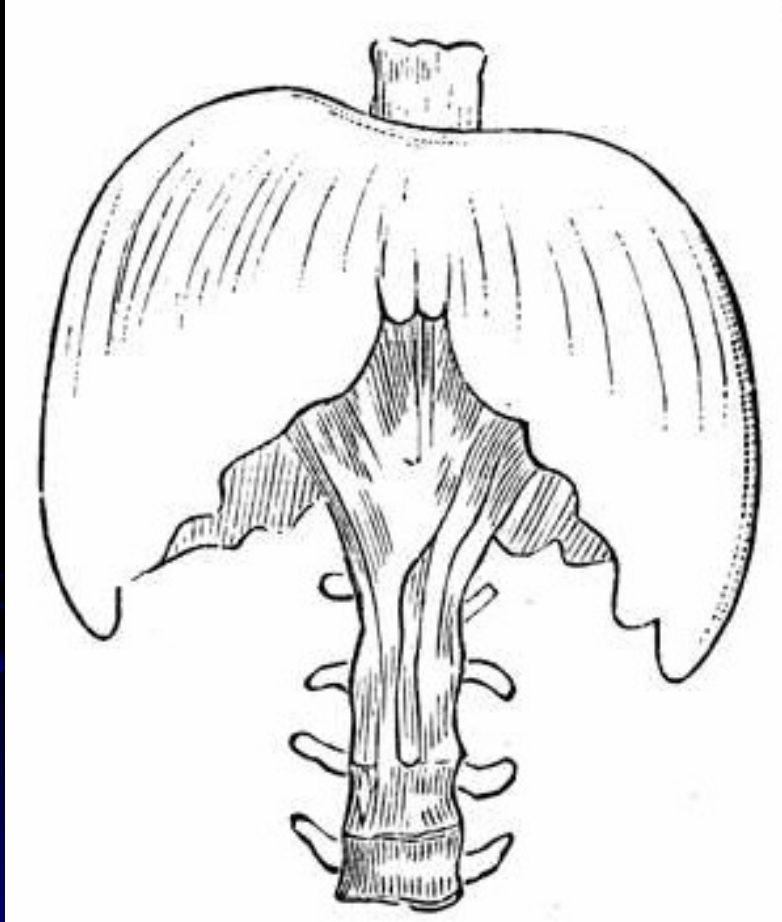


IVC Opening : T8/T9 Disk

Hiatus: T10

Aortic Opening: T12

- Aorta
- Thoracic Duct
- Azygos / Hemiazygos V



Arteria Supply :

- Right and left **Phrenic arteries**
- The **Intercostal arteries**,
- Musculophrenic branches of the **Internal thoracic arteries**
- Small branches of the **Pericardiophrenic arteries**

Venous Drainage :

- Rt. : **Inferior vena cava** and **Azygous vein**
- Lt. : **Adrenal / Renal & Hemizygous**

Nerve Supply: Phrenic nerve

- Remember that "**C3, C4, and C5 keep the diaphragm alive.**"
- Originating around the level of the **Scalenus anterior** muscle

Contraindications

- Relatively **no contraindications** have been reported for repair of an acquired diaphragmatic hernia
- Many small injuries are **discovered during** exploratory laparotomy for the repair of other intra-abdominal injuries.
- Diaphragmatic hernias **should always be repaired**.
Lack of repair of a diaphragmatic hernia can lead to incarceration and strangulation of intra-abdominal contents or respiratory dysfunction.

Imaging Studies

- **Chest radiography** is standard in the advanced trauma life support (ATLS) protocol for a trauma workup :
 - **23-73%** of traumatic diaphragmatic ruptures will be detected by **initial** chest radiograph
 - additional **25%** found with subsequent films
 - Abdominal contents in the thorax, with or without signs of focal constriction ("**collar sign**")
 - Nasogastric tube seen in the thorax
 - Elevated hemidiaphragm (**>4 cm** higher on left vs right)
 - Distortion of **diaphragmatic margin**
-
- Sliker CW. Imaging of diaphragm injuries. *Radiol Clin North Am.* Mar 2006;44(2):199-211, vii. [Medline].

- **CT scan**

- **Conventional**

- Sensitivity of 14-82%, with a
- Specificity of 87%.

- **Helical CT** increased

- Sensitivity 71-100%, with higher sensitivity left vs right.

- **CT findings indicating rupture include the following:**

- Direct visualization of **injury**
- Segmental **diaphragm** nonvisualization
- Intrathoracic **herniation** of viscera
- "**Collar sign**"
- Peridiaphragmatic active contrast **extravasation**

- **Ultrasonography (focused assessment with sonography for trauma [FAST] scan)** has been reported to detect diaphragmatic hernias.
 - Movement, Through visualization of each upper quadrants
 - This technique is limited in some patients

-
- Blaivas M, Brannam L, Hawkins M, Lyon M, Sriram K. Bedside emergency ultrasonographic diagnosis of diaphragmatic rupture in blunt abdominal trauma. *Am J Emerg Med.* Nov 2004;22(7):601-4. [[Medline](#)].

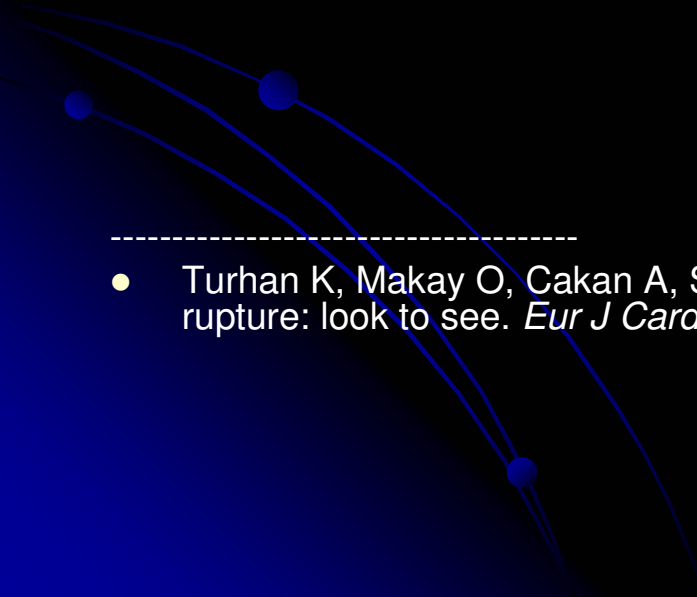
Surgical Therapy

- If the diaphragmatic injury is discovered during the **acute phase of trauma**, the standard surgical approach is **laparotomy** or, less commonly, **thoracotomy**
- When the diaphragmatic injury is **unnoticed for months or years**. More surgeons approach long-standing hernias with a **transthoracic or thoracoabdominal approach** because the herniated intra-abdominal contents tend to be firmly attached to intrathoracic structures, making a transabdominal approach difficult.
- **Laparoscopic abdominal exploration** in the setting of trauma is becoming a popular way to determine if diaphragmatic integrity is retained. It provides a minimally invasive mechanism to directly view the diaphragm to determine if an injury has occurred. In the absence of other intra-abdominal injuries, the diaphragm can easily be repaired by applying laparoscopic techniques

-
- Hanna WC, Ferri LE, Fata P, Razek T, Mulder DS. The current status of traumatic diaphragmatic injury: lessons learned from 105 patients over 13 years. *Ann Thorac Surg.* Mar 2008;85(3):1044-1048. [[Medline](#)].

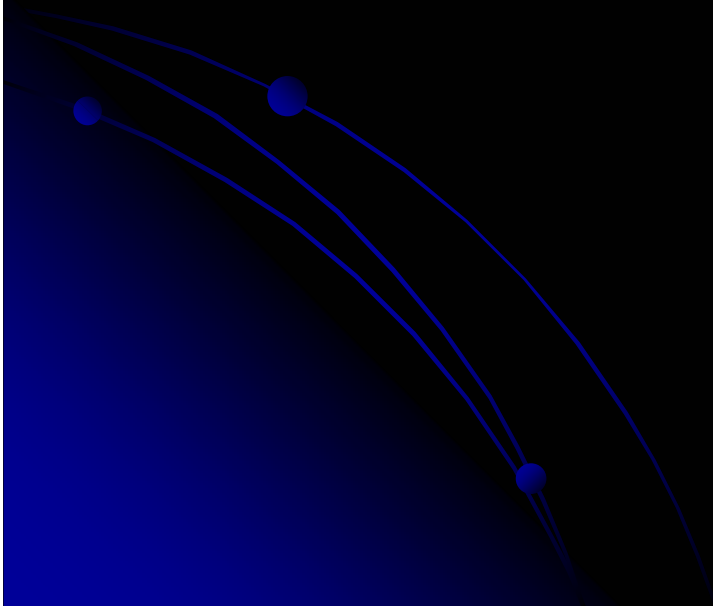
- Repair:
 - Acute injuries : monofilament permanent sutures
 - Small lacerations : interrupted, horizontal mattress, or figure-of-eight stitches
 - larger lacerations continuous or double-layered closures.

Absorbable sutures are associated with a high rate of recurrence

- 
-
- Turhan K, Makay O, Cakan A, Samancilar O, Firat O, Icoz G, et al. Traumatic diaphragmatic rupture: look to see. *Eur J Cardiothorac Surg*. Jun 2008;33(6):1082-5. [\[Medline\]](#).

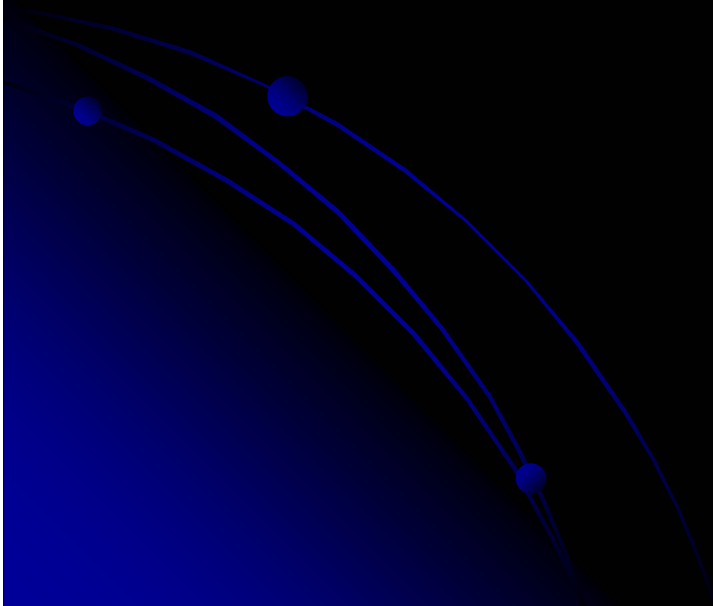
Follow-up

- **Periodic assessments** of pulmonary function and chest radiography are important
- **Spontaneous recurrence rate** for repaired diaphragmatic hernias is low,
- **Small defects in the repair** site have been reported; therefore, surveillance is crucial.



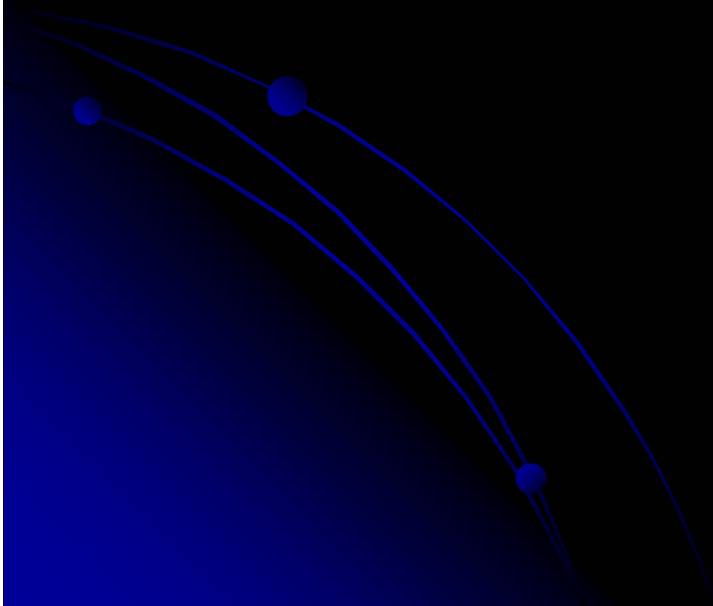
Outcome and Prognosis

- **Reported mortality ranges** from 5.5-51%.
- People with isolated diaphragmatic injuries tend to recover **without long-term disability**



Future and Controversies

- **Minimally invasive techniques** for diaphragmatic repair are becoming more common than before
- Both acute and chronic diaphragmatic hernias is possible with **laparoscopic, thoracoscopic, or combined approaches**





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Performing your original search, *Traumatic diaphragmatic hernia presenting as a tension fecopneumothorax*, in PubMed will retrieve [3 records](#).

Hernia. 2001 Sep;5(3):158-60.

Traumatic diaphragmatic hernia presenting as a tension fecopneumothorax.

Vermillion JM, Wilson EB, Smith RW.

Department of Surgery, Scott & White Clinic and Memorial Hospital, Texas A&M University System Health Science Center, College of Medicine, Temple 76508, USA. jmvvermillionmd1@yahoo.com

Abstract

Diaphragmatic injury with accompanying hernia is a well-documented complication associated with both penetrating and blunt trauma. It occurs in approximately 3% of abdominal injuries with a 2:1 ratio of penetrating to blunt trauma. Diagnosis requires a high index of suspicion since diaphragmatic injury can only reliably be ruled out by direct visualization, i.e., laparoscopy. Hence, delayed presentation with complications secondary to the injury is not uncommon. We discuss a case of a young man who presented in respiratory distress six years after a stab wound to the left chest. The patient was hypoxic, with a chest X-ray (CXR) demonstrating a pneumothorax with effusion. A chest tube was placed with a rush of air and foul-smelling purulent drainage. Work-up revealed incarcerated transverse colon in a diaphragmatic hernia. Celiotomy demonstrated necrotic colon in the chest with gross fecal contamination in both the chest and abdomen. The diaphragmatic defect was closed and a Hartmann's procedure performed. The patient did well postoperatively except for the development of an empyema, which resolved with conservative management. Our patient is the eleventh reported case of a tension fecopneumothorax resulting from traumatic diaphragmatic herniation. This paper reviews all cases including the diagnostic work-up, operative approach, and expected postoperative course of this unusual condition.

PMID: 11759804 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms

LinkOut - more resources

Related citations

Traumatic diaphragmatic hernia presenting as a tension fecopneumothorax. [Hernia. 2010]

[A late post-traumatic diaphragmatic hernia revealed by a tension f [Rev Pneumol Clin. 2009]

[Tension faecopneumothorax as the rare presenting feature of a traumati [Ann Chir. 2006]

[Review] [Iatrogenic perforation of the intrathoracic colon a [Rev Esp Enferm Dig. 1994]

[Review] Intrathoracic transverse colon and small bowel infarction in a p: [J Med Liban. 2004]

See reviews...

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Cited by 3 PubMed Central articles

Update on managing diaphragmatic rupture in blunt trauma: a review of 208 [Can J Surg. 2009]

Post-traumatic tension faecopneumothorax in a young male: case re [World J Emerg Surg. 2008]

Traumatic diaphragmatic herniation presenting as a delayed tension faeco [Emerg Med J. 2006]

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Hernia. 2010 Jan 7. [Epub ahead of print]

Traumatic diaphragmatic hernia presenting as a tension fecopneumothorax.

Khan MA, Verma GR.

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Abstract

A traumatic diaphragmatic hernia is a well-known complication following blunt abdominal or penetrating thoracic trauma. Although the majority of cases are diagnosed immediately, some patients may present later with a diaphragmatic hernia. It occurs in approximately 3% of abdominal traumas. Diagnosis requires a high index of suspicion since diaphragmatic injury can only reliably be ruled out by direct visualization, i.e., laparoscopy. Hence, delayed presentation with complications secondary to the injury is not uncommon. We discuss a case of a young man who presented in respiratory distress 5 years after a stab wound to the left chest. The patient was hypoxic, with a chest X-ray (CXR) demonstrating a pneumothorax with effusion. A chest tube was placed with a rush of air and feculent drainage. CT scan revealed an incarcerated transverse colon in a diaphragmatic hernia. The laparotomy demonstrated necrotic colon in the chest with gross fecal contamination in the chest. The diaphragmatic defect was closed and a Hartmann's procedure performed. The patient developed empyema in the postoperative period. Our patient is the twelfth reported case of a tension fecopneumothorax resulting from traumatic diaphragmatic herniation. This paper reviews all cases, including the diagnostic workup, operative approach, and expected postoperative course of this unusual condition.

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