Imperial College London

LONDON NORTH WEST HOSPITALS NHS

NHS Trust

Current Surgical Management of Enterocutaneous Fistulas

The Lennard-Jones Intestinal Failure Unit

St MARK'S HOSPITAL

MEDICAL CENTER

THIS TALK

Surgical prevention of ECF formation

Preparing the patient for surgery

The surgery to the bowel

The surgery of the abdominal wall

Prevention

90% of non-Crohn's fistulas follow surgery

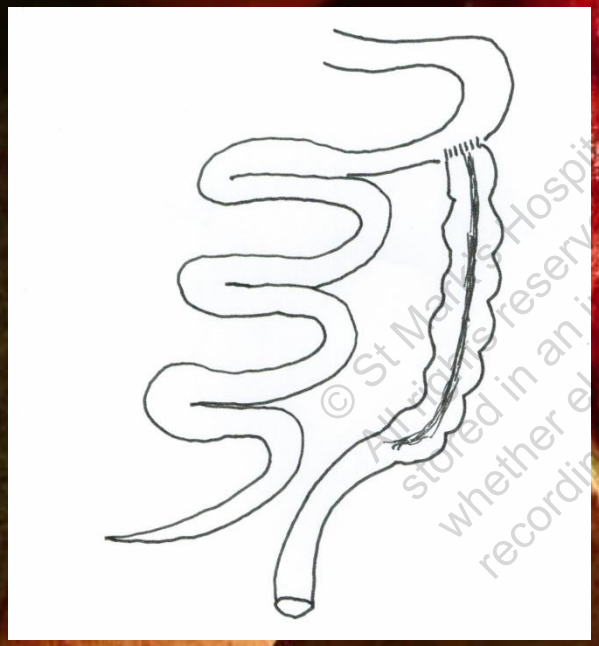
Preparation, precision surgery, post op care

Before elective surgery get the patient to lose weight and stop smoking

200kg

At surgery get the anatomy right

Closed end of ileum left in the abdomen



DJ flexure

Anastomosis

Descending colon

Always try to close the abdominal wall

Do not use VAC pumps directly on fragile bowel

Do not use non-absorbable or cross linked biological mesh next to friable bowel

TRY NOT TO REOPERATE IN THE 8 DAY TO 6 MONTH WINDOW AFTER MAJOR INTRA-ABDOMINAL SURGERY

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AND WHEN THINGS GO WRONG STOP, JUST STOP

The more you go back in the worse the situation becomes

Do not panic

Get someone else involved

If you reoperate madly....

A typical referral – a 70 year farmer

- ITU to ITU transfer in 01/10/09
- Requested by ITU anaesthetic consultant

"urgently before the surgeon operates yet again"

Clinical history

June 2008	Hartmann's for T4N1 rectal cancer followed by chemotherapy
17/08/09	Reversal of Hartmann's, ileostomy
19/08/09	Re-laparotomy, high jejunostomy for mid jejunal tear, mesh closure, VAC
26/08/09	Re-laparotomy for jejunostomy retraction, closure stoma
27/08/09	Re-laparotomy and debridement, VAC
02/09/09	Re-laparotomy for caecal perforation
18/09/09	Re-laparotomy and fasciotomy for fat necrosis
20/09/2009	Attempt to control fistula with Foley then attempt to repair it using Permacol!

On arrival

- Septic, ventilated & on inotropes
- Tracheostomy
- Severe chest infection: *E. coli*
- Bilateral pleural effusions
- Anuric requiring haemofiltration
- GCS 10/15
- Laparostomy, with prolene mesh, stoma and fistulas
- RIF collection, Candida in drain fluid

Additional diagnoses

- Alcoholic cirrhosis
- Chronic renal failure
- Coeliac trunk atrophy
- Radiological mapping
  - rectal anastomosis – leak and stenosis

Early Surgical Intervention

06/10/09	Removal prolene mesh

Transferred to IF ward 10/11/09

Total ITU stay of 83 days (both hospitals)

Discharged home 17/02/10

Homecare issues

- Discharged on HPN
- Minimal lipid in PN as abnormal LFTs
- Alcoholic partner with antisocial behaviour
- Killer dog
  - Affecting HPN administration
  - Domestic hygiene
  - Homecare nurses felt unsafe, went in 2 at a time
- Fistuloclysis (daily bolus) prior to restorative surgery

Surgery

- **Over 18 months later** readmitted surgery
- Surgical procedure
  - 2 anastomoses
  - 140cm of small bowel to most of colon
  - End colostomy
  - Strattice mesh to the abdominal wall
- Self - discharged day 22
- Of PN one month later

X Do not re-operate in the 2 week to 3 month window after intraabdominal surgery

	Early	3-12 weeks	6-12 months	>12 months
Mortality	30-100%	7-20%	3-9%	0-3%
ECF recurrence	40-60%	17-31%	10-14%	3%

Intestinal failure patient

In hospital for months	Confined to bed	Nil by mouth	High output stoma/ECF
Multiple laparotomies	Attempted ECF repairs or relook operations	Undrained pockets of sepsis	Patient wants surgical correction
Depressed	Abnormal liver functions	Repeated CVC infections	Gastroenterologist wants surgery

The pressure is on....

But be patient

and while you wait to operate…..

Optimise the nutrition

Get imaging

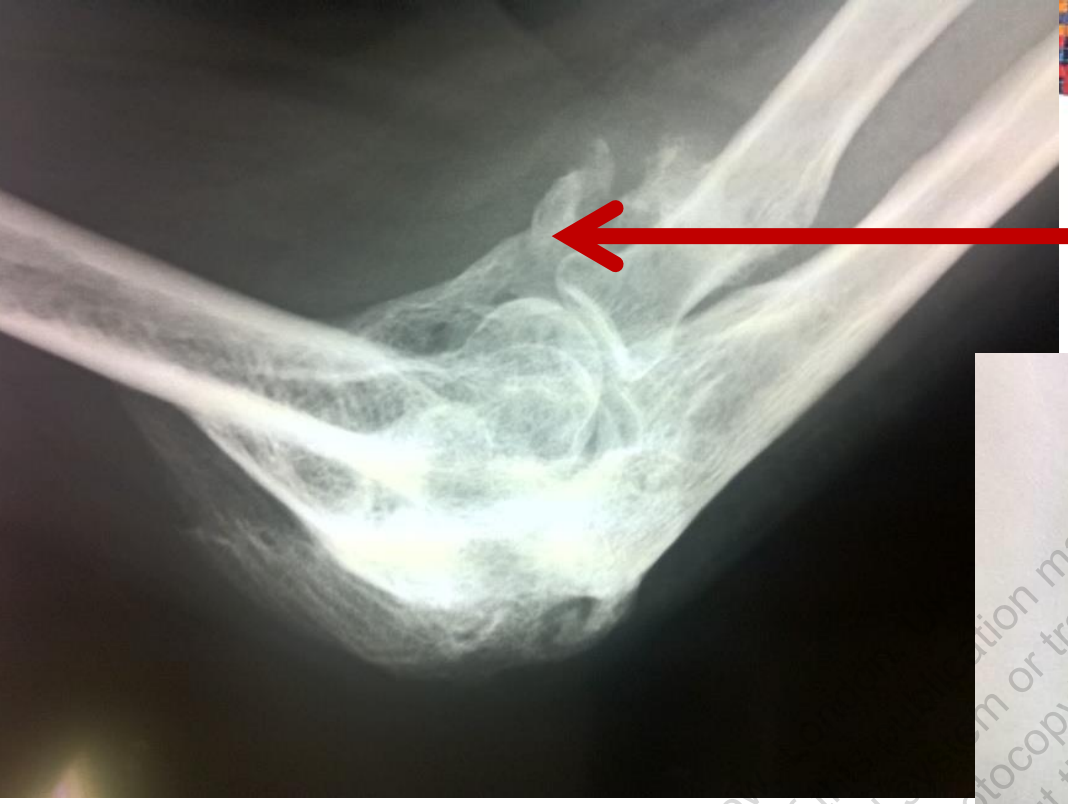
Exclude septic collections

Exclude distal obstruction

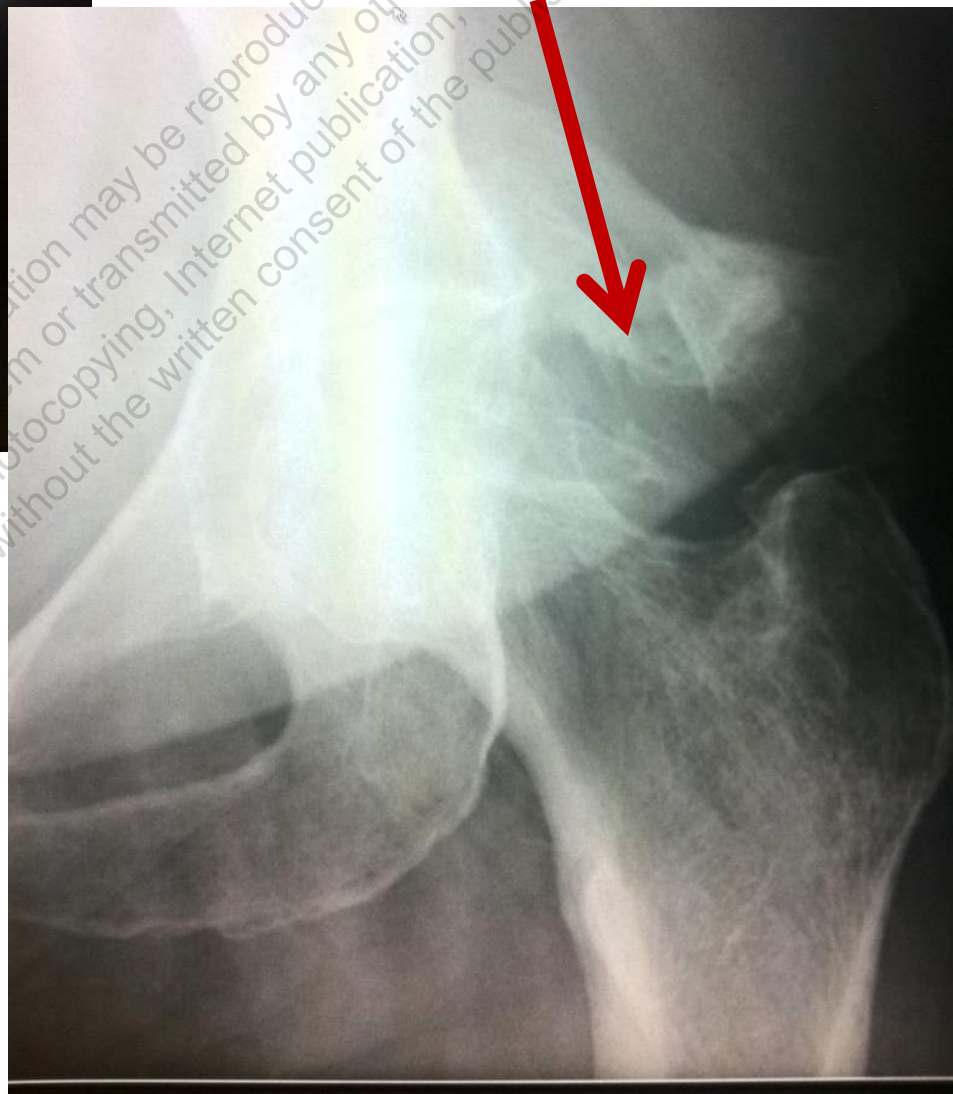
Find the optimal site of entry into the abdomen

Assess abdominal wall defects

Optimise the abdomen



Calcified joints
from immobility



Get them mobile

Exclude underlying disorders – Crohn's, Behcet's, Ehlers Danlos type IV, portal hypertension, mesenteric ischaemia

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Optimise pain management

Or postop pain management will be very difficult

Work on bad behaviour

Get support from a dedicated gastroenterology psychiatrist

Teach the patient wound care

And finally to send the patient home prior to surgery

→ The consent needs to be very broad

→ There needs to be ample time to do the operation

→ The imaging should be fresh in the surgeon's mind

→ It may be necessary to take a break mid op or have a 2nd surgeon if the operation takes >5-6 hours

→ The operative plan may need to be changed mid operation

→ We use the CT to show where to enter the abdomen – or go in next to the fistula

→ We use a scalpel to dissect very difficult areas

→ We mark or repair any serosal tears as we make them

→ We avoid anastomoses
- in malnourished patients,
- in the presence of ischaemia or
- next to active sepsis

Feel the abdomen & do a PV & PR on the table

Anastomoses should not leak ……

Measure the residual gut length

Surgery for abdominal wall defects

If in doubt abdominal CT can be used to predict difficulty of closure

Plan the operating time & order the right mesh

(+/- a plastic surgeon)

These operations are not the same as an incisional hernia repair

- The patient may be less fit
- There is always faecal contamination
- The abdominal wall is inflamed
- There are holes in the abdominal wall from fistulas and stomas
- The blood supply to the bowel may be compromised
- They may have portal HT, etc etc ….
- The operation has already taken 6 hours before you even start the closure

Outcome of reconstructive surgery for intestinal fistula in the open abdomen

Connelly, Teubner, Lees, Scott, Carlson

Ann Surg. 2008 Mar;247(3):440-4.

Sutured closure 0% fistulas

Non-absorbable mesh 24.1% fistulas

Cross linked collagen mesh 41.7% fistulas

What about the non-cross-linked meshes?

Outcomes of simultaneous large complex abdominal wall reconstruction and enterocutaneous fistula takedown

Krpata et al , Am J Surg 2013;205:354-8

Major complex abdominal wall repair in contaminated fields with use of a non-cross-linked biologic mesh: a dual-institutional experience

J.J. Atema[1], E.J. Furnée[2], Y. Maeda[2], J. Warusavitame[2], P.J. Tanis[1], W.A. Bemelman[1], C.J. Vaizey[2], M.A. Boermeester[1]

1 Department of Surgery, AMC, Amsterdam

2 Department of Surgery, St Mark's Hospital

	Krpata	St Mark's / AMC
Wound morbidity	65% 1/3 superficial 1/3rd deep 1/3rd organ space	44%
Mesh removal	0%	0%
Early recurrent fistula	11%	9%
Recurrent hernia	32%	13%
Median f-up	20 months	7 months

Which Biological?

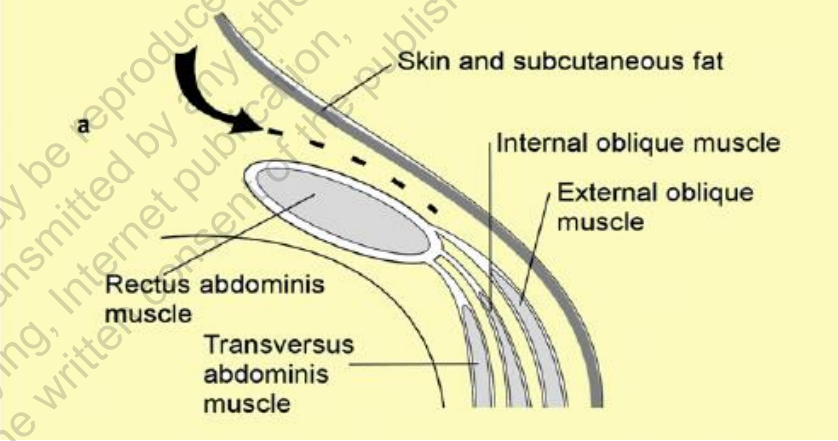
Brand Name	Company	Type		Additionally Crosslinked?	Sterilized?
Alloderm®	LifeCell	Dermis	Human	No	No
Allomax™	CR Bard	Dermis	Human	No	Yes
FlexHD™	MTF	Dermis	Human	No	No
Strattice®	LifeCell	Dermis	Porcine	No	Yes
Surgimend®	TEI	Dermis	Bovine fetal	No	Yes
Surgisis®	Cook	Intestinal submucosa	Porcine	No	Yes
Tutopatch®	Tutogen	Pericardium	Bovine	No	Yes
Veritas®	Synovis	Pericardium	Bovine	No	Yes
XenMatrix™	CR Bard	Dermis	Porcine	No	Yes
BioA®	WL Gore	Synthetic bioabsorbable		N/A	Yes
TIGR®	Novus Scientific	Synthetic bioabsorbable		N/A	Yes

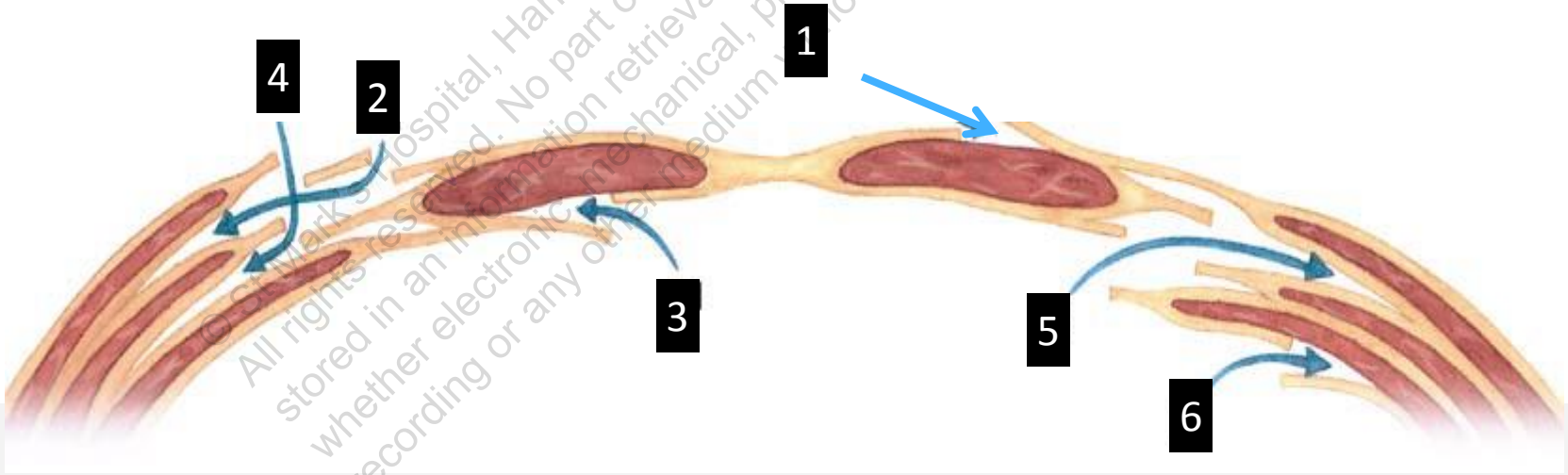
What is the best technique?

Fascial release – EO released just lateral to rectus sheath can gain 10cm in either direction to close a 20cm defect

Component separation

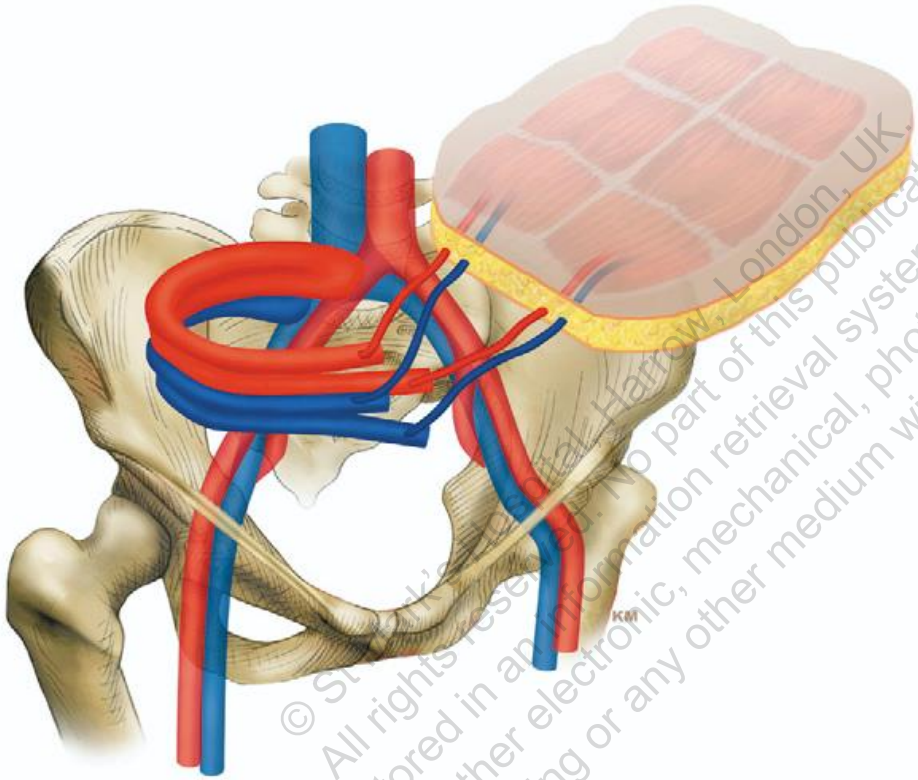
Is not easy to do when there are fistulas, 1 or 2 stomas & inflammation / fibrosis of the abdominal wall





When do you use a plastic surgeon?

Abdominal Wall Transplant



Enterocutaneous fistulas traumatise patients – get it right first time (GIRFT)