
PELVIC EXENTERATION BASICS FOR TRAINEES

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Introduction

Pelvic exenteration is major pelvic surgery that extends beyond the usual surgical planes with typically removal of 2 major organs as a minimum and often involving excision of major vessels / nerves / bones.

In the colorectal setting this is due to **advanced or recurrent rectal or anal cancer**. Gynae-oncology also perform exenterations for gynaecological cancers and they can also be performed in the sarcoma and melanoma setting.

General Statistics

- 10% of rectal cancers present with locally advanced disease
- 10-20% of patients with colorectal cancer develop recurrence
- 1-2% short term post op mortality for exenteration, virtually 100% morbidity
- Overall ~50% 5-year survival for pelvic exenteration with an R0 resection

Indications and Contraindications

In simple terms the indication for pelvic exenteration surgery is advanced primary or recurrent pelvic cancer which has spread to surrounding structures. Achieving an R0 resection must be prioritized. The simplest contraindication is an inability to achieve an R0 resection.

Reminder: R0 resection (no cancer cells seen microscopically at the primary tumour site) R1 (cancer cells present microscopically at the primary tumour site) R2 (Macroscopic residual tumour at primary cancer site or regional lymph nodes)

Metastatic disease e.g. liver, pulmonary is not an absolute contraindication if the metastatic sites are for example resectable / well controlled / slow growing.

Factors to consider when deciding whether exenteration is offered:

- **Tumour biology**
 - Is there metastatic or oligometastatic disease?
 - Oligometastatic (1–5 metastatic lesions in 1 or 2 organs)
 - Metastatic (≥6 metastases in 1 or 2 organs)
 - The general aggressiveness and response of the tumour to previous / current oncology treatments
 - Genetic markers

In summary is there widespread aggressive metastatic disease that renders exenteration futile?

- **Patient fitness and circumstances**
 - Patient baseline and comorbidities
 - Can they improve with prehabilitation?
 - Will the morbidity be survivable?
 - Will the post op function be acceptable to the patient?

In summary could the patient survive the operation and live afterwards to an acceptable function?

- **Resectability of the tumour**

- Is it going to be possible to achieve an R0 resection?
- Careful review of pre op imaging and discussion in MDT
- What structures will need to be removed and is this technically feasible (either at your centre or another centre)
- Historically, involvement of the upper sacrum, sciatic nerve or iliac vessels was a contraindication but these days the boundaries are being pushed at various centres in terms of what is resectable and there is no precise limit as to what can be surgically excised. Removal of structures must be balanced with the morbidity/function and the likelihood of an R0 resection

In summary what is the likelihood of an R0 resection, what structures need to be removed and is that possible?

- **Neoadjuvant and adjuvant treatment**

- Can the malignancy be down staged or controlled further before surgery?
- Radiotherapy, chemoradiotherapy, total neoadjuvant treatment

In summary are there other treatment options that would help before or after exenteration?

Palliative exenteration

Occasionally palliative exenteration might be an option for the management of very debilitating symptoms e.g. painful, fungating tumours with incontinence / recurrent sepsis from fistulation. The aim is not for a cure or R0 resection or to lengthen life but to improve remaining quality of life.

Pre-operative work up

- A patient will either be presenting with a new primary advanced tumour or as a follow up in clinic with symptoms that may suggest recurrence of cancer
 - *Take a careful history at every follow up cancer appointment, examine the patient and review CT CAP, CEA and colonoscopy results*
- General investigations include
 - CEA and routine bloods
 - Pelvic MRI
 - CT CAP
 - PET scan
- Imaging should be conducted as close to the time of surgery as possible
- A tissue diagnosis is required to confirm that this is a new cancer or cancer recurrence to avoid performing an exenteration on a patient with benign disease
- The patient should be discussed at **MDT (imperial.lqi.mdt@nhs.net)**
 - Carefully look at pre op imaging to decide on a precise surgical plan
 - Many experts say that surgery should be planned around the original pre-treatment MRI (as opposed to post chemoradiotherapy down staged MRI) due to concerns that the tumour may have fragmented
- Meet consultant and CNS in clinic
 - As a registrar you will not be expected to decide or counsel a patient for exenteration independently
 - An honest discussion is had with the patient about the extent of this surgery and whether the risks are acceptable to them
 - Review symptoms e.g. pain, obstruction, infection
 - Start consent process on concentric

- Meet stoma nurses
 - Pre op marking and counselling done in advance

Pre-op jobs for colorectal registrar

- Review notes as soon as you know the case is scheduled
 - Look for key medications that might need to be held e.g. anticoagulants
 - Check bowel prep is prescribed for patient to collect
 - Check for any investigations incomplete from anaesthetic pre op assessment e.g. patient needs echo
 - Check for rare blood type / antibodies which may require additional time to prepare blood
- Ensure there is up to date imaging
 - At least up to date CT CAP and MRI pelvis in the last 2 weeks, check with the consultant they are happy with the last imaging date and if more up to date scans are required
 - This is very important as you do not want to find on the day of surgery that the disease is more advanced than anticipated
- Consenting the patient
 - Use concentric which has an option for total pelvic exenteration
 - Add on individual components
 - E.g. Obturator excision, internal iliac vessel/node excision, sacrectomy
 - Prepare the consent form for all teams involved (vascular, plastics, orthopaedics) so that only one consent form is required
 - Know the relevant risks to discuss with the patient (discussed later)
 - Take the details of the patients NOK on the day of surgery and ask them if they are happy to be phoned at all times of the night if the operation finished very late

General tips for beginners talking about exenteration surgery:

This is a major 10-hour operation with 3 days in ITU, 3 weeks in hospital and 3 months until you are back to a reasonably normal life. There is a 1-2% mortality but virtually 100% morbidity with complications of some kind expected

- Book a critical care bed
 - Ideally do this as soon as you find out the operation is scheduled
 - This can be done on cerner 'critical care bed request'
 - Fill in the date of the operation
- Warn the lab in advance regarding blood products
 - You can telephone or email the lab in advance to warn them that a major case is scheduled with likelihood of needing blood, FFP, platelets, cryoprecipitate

imperial.cxh.btlab@nhs.net

- Blood tests
 - On the day a fresh group and save will be required
 - Phone the lab to ensure products are available

Surgical Teams Involved

Generally multiple surgical teams are involved in each operation including:

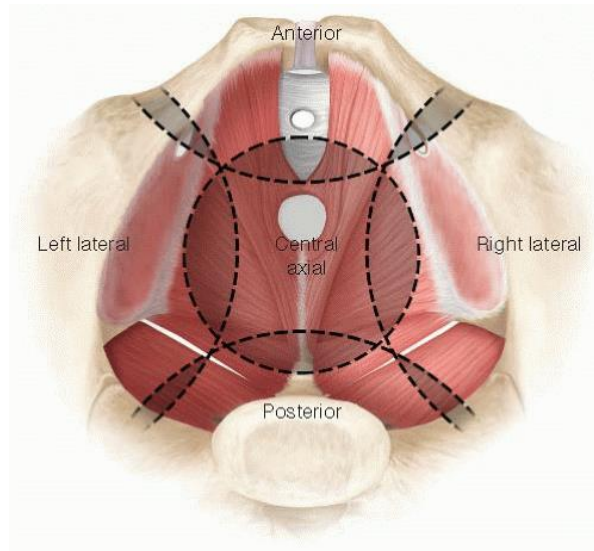
- Colorectal
 - Mr George Reese, Miss Maria Souvatzi
- Vascular
 - Prof David Nott, Mr Rick Gibbs, Miss Sarah Onida
- Urology
 - Miss Eva Bolton, Ms Norma Gibbons, Mr David Hrouda, Prof Heer
- Plastics
 - Mr Vimal Gokani, Mr Simon Wood, Mr Graham Lawton
- Orthopaedics
 - Mr Jas Daurka

Exenteration Surgery

This surgical exenteration lexicon (Burns et al) is a useful way to standardise description of exenteration procedures and to understand what options are available.

Posterior			
P1 Presacral			<input type="checkbox"/>
P2 HiSS (High Subcortical Sacrectomy)			<input type="checkbox"/>
P3 Low sacrectomy ($\leq S3$)			<input type="checkbox"/>
P4 High sacrectomy ($\geq S2$)			<input type="checkbox"/>
P5 Sacrectomy requiring stabilisation			<input type="checkbox"/>
Anterior			
A1 Partial cystectomy			<input type="checkbox"/>
A2 Ureteric resection with reimplantation			<input type="checkbox"/>
A3 Total cystectomy or radical cystoprostatectomy	L <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
A4 Cystectomy with pubic bone resection			<input type="checkbox"/>
A5 Cystectomy with complete penectomy			<input type="checkbox"/>
Central			
C1 Rectum or TAH/BSO			<input type="checkbox"/>
C2 Rectum+/-TAH/BSO/partial vaginectomy or seminal vesicle/ partial or complete prostatectomy			<input type="checkbox"/>
C3 Rectum + TAH/oophorectomy + total vaginectomy			<input type="checkbox"/>
Pelvic sidewall			
L=left R=Right			
Vessels			
SV1 Lymphadenectomy	L <input type="checkbox"/>	R <input type="checkbox"/>	
SV2 Distal branches of internal iliac artery	L <input type="checkbox"/>	R <input type="checkbox"/>	
SV3 Proximal internal iliac artery and vein	L <input type="checkbox"/>	R <input type="checkbox"/>	
SV4 External iliac artery or vein +/- internal iliac artery or vein	L <input type="checkbox"/>	R <input type="checkbox"/>	
Nerves			
SN1 Obturator nerve	L <input type="checkbox"/>	R <input type="checkbox"/>	
SN2 Single nerve root	L <input type="checkbox"/>	R <input type="checkbox"/>	
SN3 Multiple nerve roots (S2 or below/partial sciatic nerve resection preserving L5/S1)	L <input type="checkbox"/>	R <input type="checkbox"/>	
SN4 Multiple nerve roots (S1 and below/partial sciatic nerve resection preserving L5 nerve root)	L <input type="checkbox"/>	R <input type="checkbox"/>	
SN5 Complete sciatic nerve including lumbosacral trunk resection (include L5 nerve root) or more extensive notch clearance	L <input type="checkbox"/>	R <input type="checkbox"/>	
Pelvic floor/muscles			
PM1 Levator Ani	L <input type="checkbox"/>	R <input type="checkbox"/>	
PM2 Levator Ani, sacral ligaments and muscles +Ischial spine	L <input type="checkbox"/>	R <input type="checkbox"/>	
PM3 Iliacus/ iliopsoas resection/Iliac crest resection	L <input type="checkbox"/>	R <input type="checkbox"/>	
Reconstruction			
F1 Perineal flap reconstruction used, please state type			
F2 Urological reconstruction please state type			
Additional			
E1 Common iliac lymphadenectomy	L <input type="checkbox"/>	R <input type="checkbox"/>	
E2 Para-aortic lymphadenectomy			<input type="checkbox"/>
E3 Femoral nerve resection	L <input type="checkbox"/>	R <input type="checkbox"/>	
E4 Common iliac artery or vein resection	L <input type="checkbox"/>	R <input type="checkbox"/>	
E5 Other not included above, please state			

The pelvis can be divided into anterior, posterior, central, right lateral and left lateral compartments to plan surgery.



GENERAL OPERATIVE INFORMATION

Technique: Laparotomy (although increasingly you may see laparoscopic assisted and robotic cases attempted)

Positioning: Modified Lloyd Davies position, may require subsequent prone positioning for sacrectomy and plastics reconstruction

Anaesthetic: Central line, arterial line, epidural, post op ITU



CENTRAL COMPARTMENT

Excision of structures in the central compartment can include:

- Removal of rectum, hysterectomy, bilateral ovaries, partial or total vaginectomy, seminal vesicles, partial or total prostatectomy

ANTERIOR COMPARTMENT

Structures in the anterior compartment:

- Bladder Prostate Urethra Pubic bone External genitalia

Exenteration in the anterior compartment could involve:

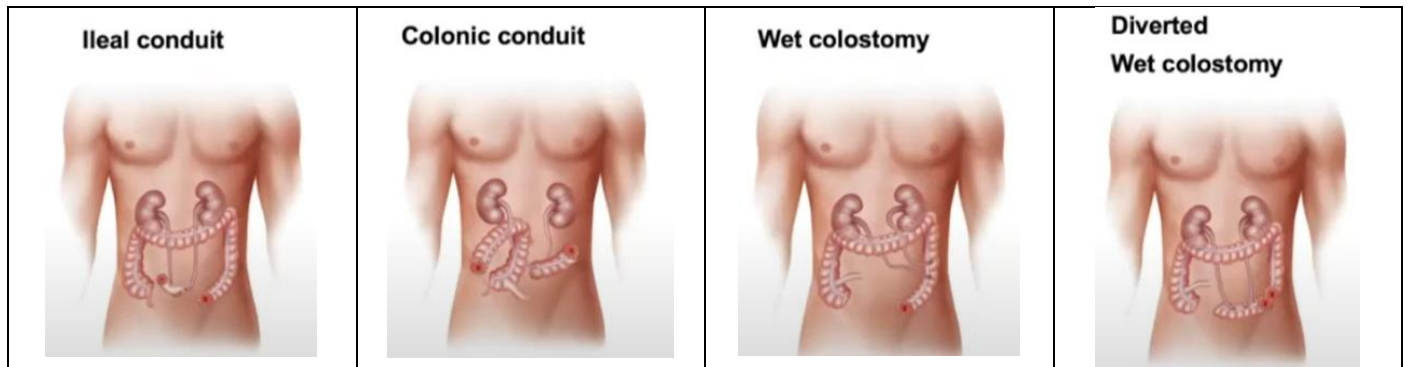
- Partial or total cystectomy, ureteric excision and reimplantation, cystoprostatectomy, cystectomy with pubic bone resection, cystectomy with penectomy, vulval excision

The decision around whether to perform a partial or total cystectomy depends on how much and what parts of the bladder are involved. If the ureters or trigone of the bladder are involved, then total cystectomy is preferred. Regardless of involvement, partial cystectomy can result in a poor functional outcome due to previous surgery and radiotherapy

there may already be bladder damage, so leaving a small and dysfunctional bladder may not be a good option anyway. Repairing and closing a radiotherapy damaged small bladder may also be technically more challenging.

Urinary reconstruction options

Following total cystectomy



- The ileal conduit tends to be the most common approach
 - The ureters are divided at the level of the iliac bifurcation
 - A 35cm section of ileum is isolated from the rest of the ileum with its mesentery, 25cm from the ileocaecal valve
 - The ureters are spatulated and anastomosed in an end to side fashion around Bander stents
 - The ileum is spouted usually in the RIF
 - Post operatively – daily creatinine check, send drain fluid for creatinine on day 3-4 post op, Bander stents to remain in situ for 2 weeks
- If the small bowel is very damaged from radiotherapy for example other reconstruction options can be used
- The wet colostomy, sometimes called a Carter stoma is a single stoma producing faeces and urine and therefore tends to produce an unpleasant smell which patients understandably do not like
- The diverted wet colostomy, used for example if the patient still has their sigmoid colon, produces less of an odour

POSTERIOR AND LATERAL COMPARTMENTS

Structures in the posterior and lateral compartments:

- Parietal peritoneum Ureter Iliac arteries/veins Pelvic fascia Nerves, Muscles Bones, Ligaments

Exenteration in the posterior and lateral compartments could involve:

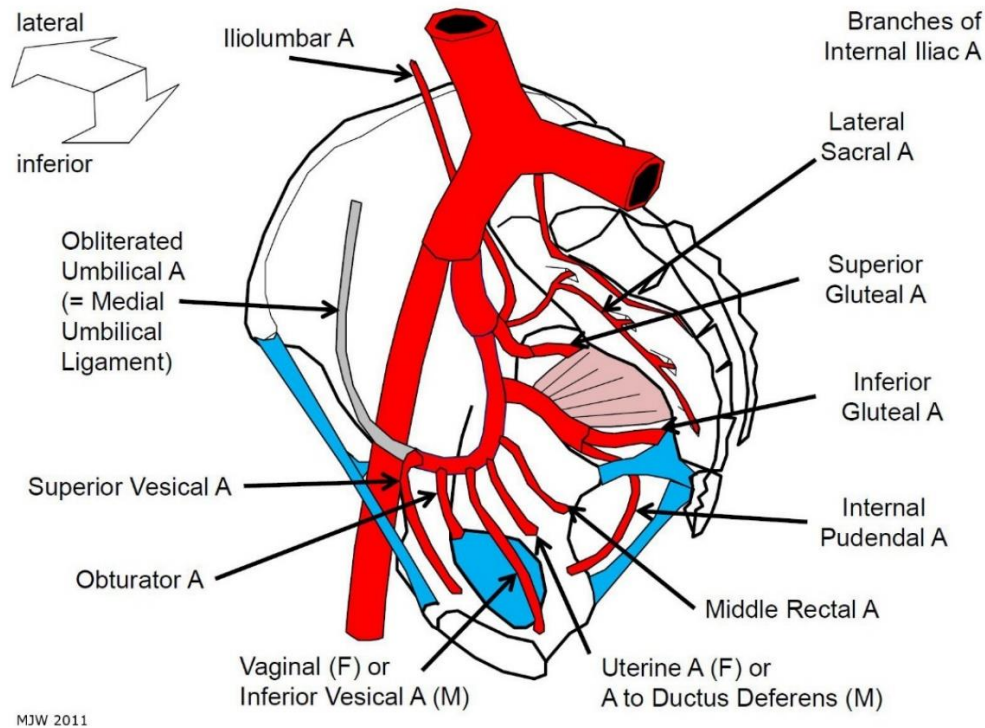
- *Removal of presacral fascia, low or high sacrectomy, sacrectomy with stabilisation*
- *Internal iliac artery and vein*
- *External iliac artery and vein, common iliac artery and vein*
- *Lymphadenectomy*
- *Obturator nerve, obturator muscle*
- *Single lumbar / sacral nerve roots*
- *Multiple nerve roots / partial sciatic nerve resection / complete sciatic nerve resection, extensive sciatic notch clearance*
- *Levator ani, sacral ligaments and muscles, ischial spine, iliacus, iliopsoas, iliac crest resection*

Reminder of the lumbosacral trunk: sciatic nerve L5-S3, obturator nerve L2-L4

The lateral compartment around the **obturator foramen** can be quite unfamiliar territory for a trainee. A pelvic orthopaedic consultant will often join for this part of the case.

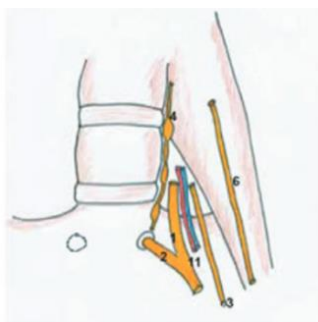
It is possible to divide **lumbosacral roots**, either individual or multiple roots. It is also possible to divide a sciatic nerve and patients may still be able to walk after unilateral nerve division. The majority of patients with pre-operative involvement of a nerve will already have some combination of neuropathic pain, difficulty walking and foot drop anyway.

A key principle for operating safely in this territory (lateral compartment) is to obtain vascular control pre-emptively both proximally and distally before dissecting out the area territory. For example, ligating off the internal iliac artery and vein before proceeding to dissect out the obturator muscle and nerve will help to reduce risk of bleeding.



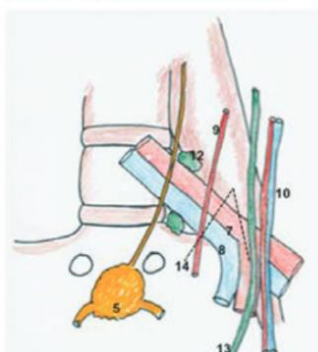
The **internal iliac vessels** can be tied off near their origin without the need for reconstruction, vascular surgery usually attend for this part of the case. Ligation of the common and external iliac vessels will usually require reconstruction.

The **ureter** crosses over **the common iliac vessels**, a good place to start in this territory is to identify a sling the ureters.



FOUR Nerves

- Lumbosacral trunk (L4-5)
- Obturator nerve
- Sympathetic trunk
- Sympathetic branch to the superior hypogastric plexus (and then by hypogastric nerves to the inferior hypogastric plexuses)

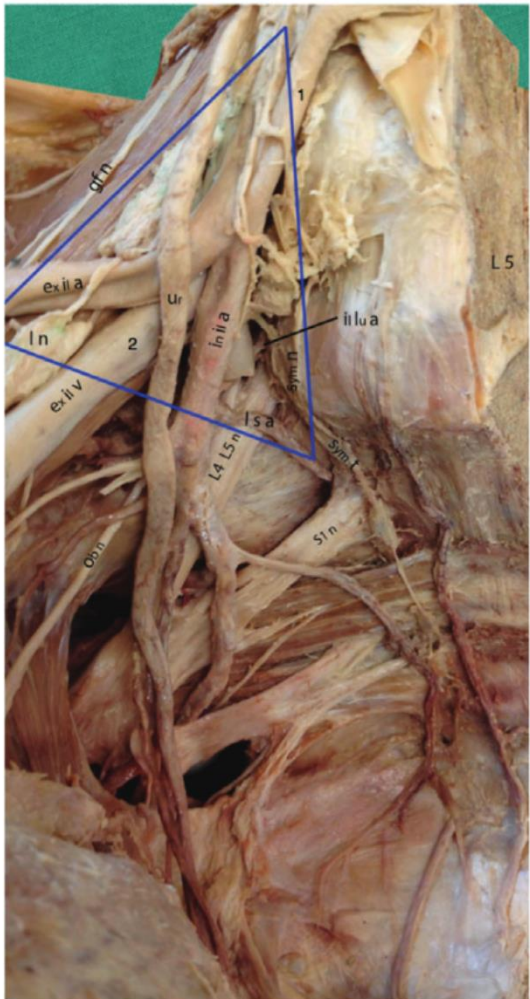


SIX Vessels

- Left common iliac artery at bifurcation
- Left common iliac vein forms
- Inferior mesenteric artery crosses (becoming superior rectal artery) (left)
- Gonadal vessels (laterally)
- Iliolumbar artery (passes upward)
- Lymphatic vessels to the iliac glands

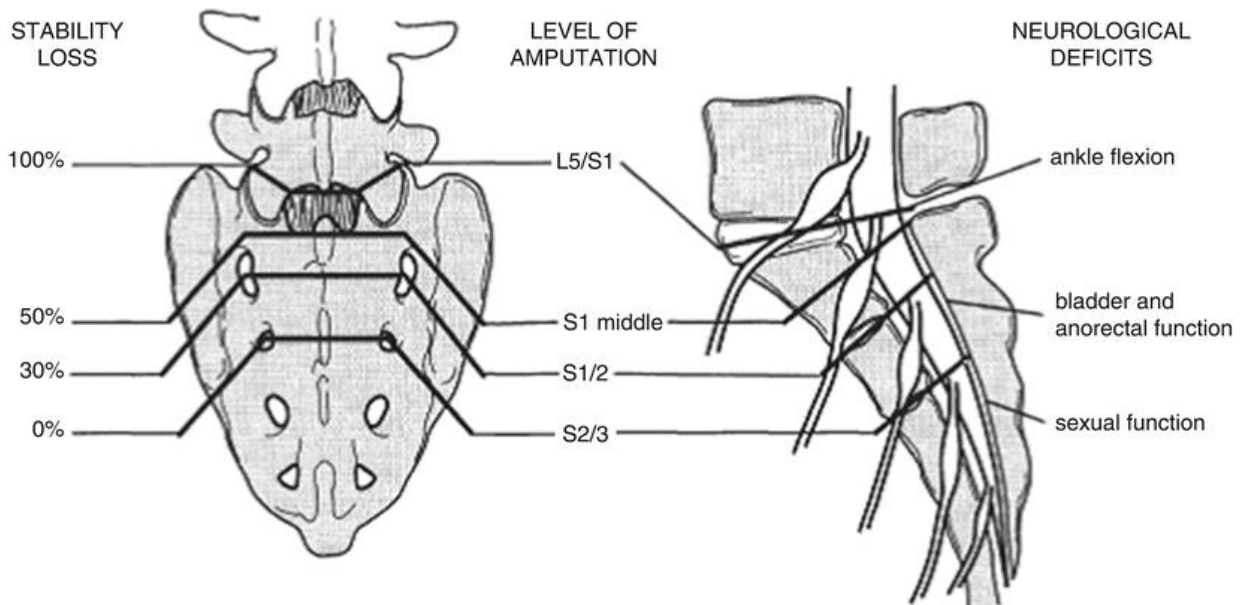
TWO Others

- Ureter
- Root of the pelvic mesocolon (left)

<p style="text-align: center;">Vessels</p> <p>1 – Common iliac artery ex ii a – External iliac artery in ii a – Internal iliac artery 2 – External iliac vein III u a – Iliolumbar artery I s a – Lateral sacral artery</p> <p style="text-align: center;">Nerves</p> <p>L4 L5 n – Lumbosacral trunks S1 – First sacral nerve Ob n – Obturator nerve Gf n – Genitofemoral nerve Sym t – Sympathetic trunk Sym n – Sympathetic nerve</p> <p style="text-align: center;">Ur – Ureter L5 – 5th lumbar vertebra bone</p>	
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(Lee et al)

Sacral resection can span from simply the presacral fascia to frank removal of the bone due to involvement. Low sacrectomy is considered to be S3 and below, high sacrectomy is S2 and above. High sacral involvement used to be a contraindication to exenteration surgery but can now be attempted, usually with the involvement of orthopaedics and or neurosurgery, although it is technically challenging with high morbidity and functional sacrifices.



(Tomita et al)

ADDITIONAL COMPONENTS

Additional excisions if involved can include:

- *Common iliac lymphadenectomy, inguinal groin dissections, para aortic lymphadenectomy, femoral nerve resection, common iliac artery/ vein resection, levator ani, sacral ligamental and muscles*

Reconstruction

Following extensive excision of various structures and organs there is a good deal of reconstruction required which can be divided by system:

- Urological
 - Usually, ileal conduit as previously discussed
- Vascular
 - Common and external iliac usually require reconstruction
 - Autologous (patient's own vein e.g. saphenous)
 - Graft (synthetic or biological)
- Intestinal
 - Large bowel anastomosis
 - Small bowel anastomosis for small bowel involvement and as part of ileal conduit
- Bone
 - Sacral implants
 - Pubic bone mesh
- Perineum and soft tissue
 - Primary closure
 - Flaps

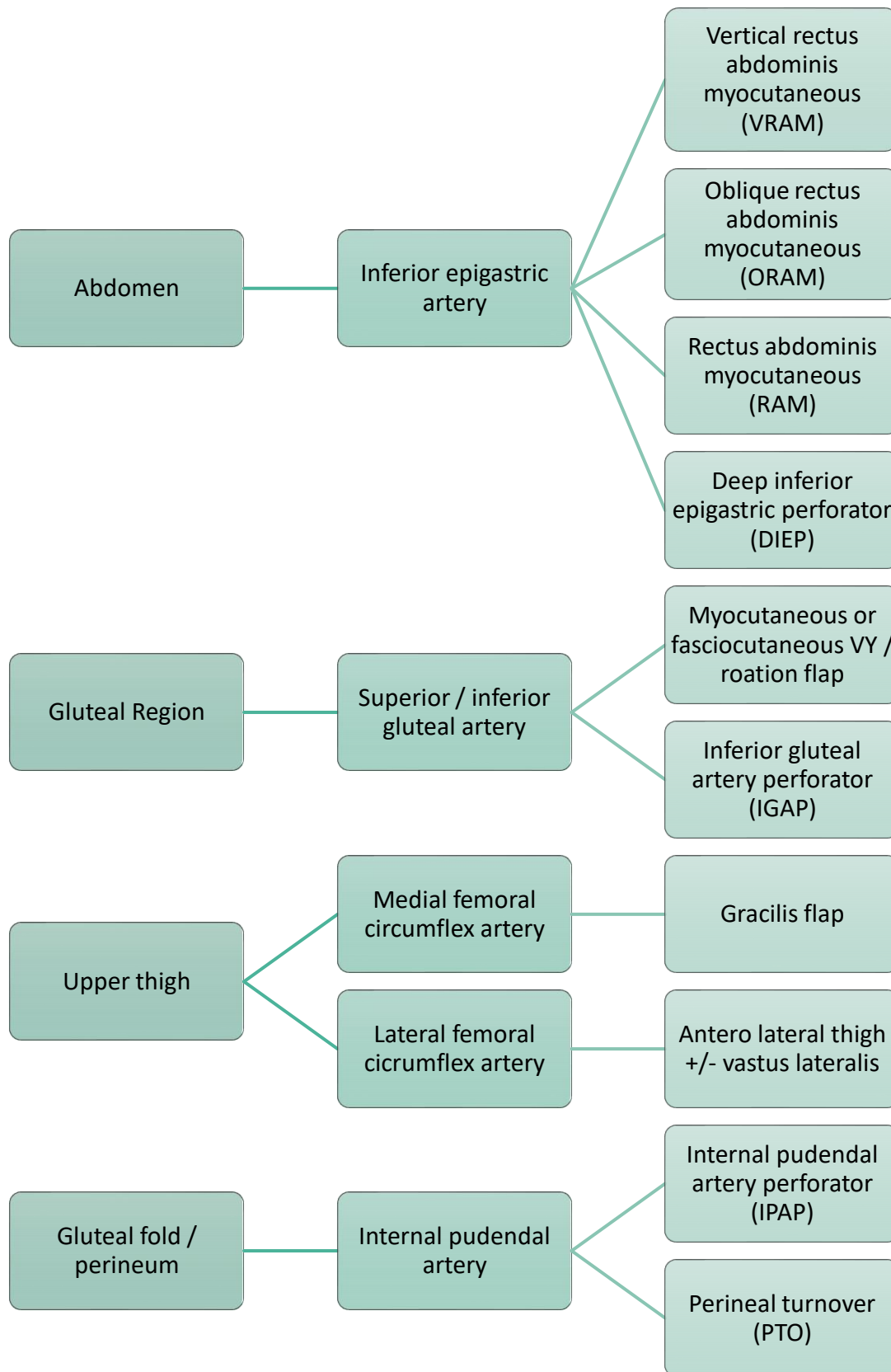
Perineal closure

A large defect may be left in the perineum during exenteration surgery due to excision of the rectum +/- vagina +/- external genitalia. Primary closure is usually not sufficient to close the space, in particular as wound infection, dehiscence and hernias are more common in patients who have previously undergone radiotherapy or already had surgery such as AP resection, ELAPE and with diagnoses such as anal SCC.

Flap reconstruction

Flaps can help close these large defects and prevent complete perineal wound breakdown. They don't completely prevent perineal hernias or fill the empty pelvis and they are still subject to infection and dehiscence complications themselves. Since the abdomen tends to accumulate serous fluid post operatively, the natural drainage point due to gravity is through the perineum which can cause problems for flap healing. For this reason, drains must be carefully managed post operatively.

The figure below summarises the main types of flap according to their donor site. VRAM, IGAP and gracilis flaps are commonly used. Each flap has particular considerations, for example in VRAM stoma siting needs to be worked around flap mobilisation.



(Adapted from Witte et al)

Mesh reconstruction

Both synthetic e.g. prolene and biological meshes can be used in pelvic reconstruction, although this is less commonly used than flap reconstruction.

Prolene mesh can also be used for pubic bone reconstruction to prevent rectus abdominus collapse.

Mesh may also be used in the future setting of perineal hernia repair.

Complications

- Post operative mortality 1-2%
- Morbidity virtually 100% in that some complications are expected / inevitable
- Approximately 50% 5 year survival
- Complications can be divided into
 - Early / short term / late
 - By system involved e.g. urinary, vascular, neurological

A look at specific complications:

General

- Pain
- Bleeding including major haemorrhage
- Infection (pelvic collection, wound infection, flap infection, pneumonia, mesh infection)
- VTE / PE
- Perineal hernia
- Empty pelvis syndrome
- Mortality

Gastrointestinal

- Bowel obstruction
- Fistulation including enteroperineal fistula
- Stoma dehiscence / retraction / ischaemia / parastomal hernia
- Anastomotic leak

Urinary

- Anastomotic leak from ureteric reconstruction
- Stricture
- UTI / urinary sepsis

Plastic surgery

- Dehiscence
- Flap necrosis
- Infected mesh

Neurological / orthopaedic / vascular

- Lymphoedema
- Foot drop
- Numbness
- Paralysis
- Osteomyelitis

Empty pelvis syndrome

There is no agreed definition for what constitutes empty pelvis syndrome as a complication, depending on the description it can be considered as very common and can encompass:

- Pelvic fluid collection / abscess
- Perineal wound / flap dehiscence
- Perineal hernia
- Intestinal obstruction
- Enteroperineal fistula

Essentially all patients will fill the empty pelvic cavity with some serous fluid due to the post operative inflammatory state and the tendency of the body to fill empty spaces.

This fluid accumulation can be problematic if it starts to leak out of the perineal wounds, rendering them open for long periods with slow healing. For this reason it is **very important** that drains stay in for much longer (ideally until discharge) than you may be used to for other patients. These fluid collections are frequently reported as pelvic collections on imaging although though are not necessarily infected and over investigation / over drainage of them should be avoided, in particular avoiding insertion of drains near perineal wounds / through flaps.

Prevention

Prevention or minimization of empty pelvis syndrome compromises keeping the pelvis as full as possible, for example using techniques such as:

- Keeping the uterus if not involved
- Omentoplasty
- Myocutaneous flaps can somewhat fill the pelvis

Post-operative management

- Heparin usually held that evening
- Sips water
- NG tube
- Continue antibiotics
- TPN often required

- ITU stay for 3 days
- Hospital stay for at least 3 weeks
- Keep abdominal Robinsons drains virtually until discharge
- Post op flap instructions for sitting and mobilising as well as Redivac drains as per plastics
- Ureteric stents for 2 weeks as per urology

- Encourage regular colorectal CNS input for support

Post-op jobs for colorectal registrar

Call family post op (remember to take number down at the start)

Histology – usually multiple pots, ensure accurate description, send as urgent

Make sure patient is on MDT (imperial.lgi.mdt@nhs.net)

Write operation note (example op note included at the end). Please write ***COMPLEX CANCER SURGERY*** at the top of the operation note as this affects coding and funding.

Make sure medication instructions are clear e.g. continue antibiotics, hold heparin as patient is going to ITU drug chart can only be done by then

Post op ward rounds, patient will be under general surgery, ensure you liaise with each team

Example Operation Note

COMPLEX CANCER SURGERY

TOTAL PELVIC EXENTERATION + RIGHT HEMICOLECTOMY + SMALL BOWEL RESECTION + EXPLANTATION OF RIGHT INTERNAL ILIAC PEDICLE + CARTER STOMA + RIGHT PEDICLED ORAM FLAP RECONSTRUCTION OF PERINEUM

Surgeons: General:
 Vascular:
 Urology:
 Plastics:

Anaesthetist:

Indication: Lap converted to open Anterior Resection for rectal cancer 2019. Right pelvic sidewall recurrence involving Caecum, small bowel, right ureter and very close to Right I.I.A pedicle

Incision: Large midline laparotomy

Findings: Hostile abdomen
Dense adhesions
Very fixed pelvis, friable tissue and radiotherapy changes
Caecum, several small bowel loops, posterior vaginal fornix, right ureter (stented) adherent to mass

Procedure: Careful entry, dense adhesions
Extensive adhesiolysis, several serosal tears encountered
All serosal tears closed with interrupted Vicryl
Lateral mobilisation of caecum which was adherent to cancer
Division of small bowel adherent to cancer
Descending colon divided
Right ureter traced, divided distally
Right Common Iliac Artery identified and traced to bifurcation.
Right Internal Iliac Artery and Vein skeletonised and ligated with x2 Silk ties
Pelvic dissection commenced to include all of the above structures en-block.
Left ureter divided distally. Bladder mobilised and taken with specimen
The sciatic nerve or a branch of it was encountered on the lateral pelvic side wall, it was not injured.
The previous colo-rectal anastomotic staple line appeared to be adherent to pre-sacral fascia.
Entire rectum mobilised to pelvic floor
Perineal dissection included anus, vagina and urethra
Entire specimen taken en-block
Contamination from rectal and small bowel perforation
Copious washout and irrigation

Carter Stoma with double barrelled loop colostomy performed, delivered to Left abdomen.
Small bowel anastomosis performed with ante-peristaltic stapled anastomosis with TA90 across.
Ileo-colic anastomosis performed with ante-peristaltic stapled anastomosis with TA90 across.
Both anastomoses had crotch sutures and complete staple line burying
For conduit related anastomosis please refer to urology note.

Haemostasis checked. Patient generally oozy and slow to clot. No obvious bleeding source
Pedicle (Inf. Epi. Art) flap reconstruction of perineum performed.

20 Fr Robinsons drain to pelvis exiting on right side.
20 Fr Robinsons drain to left paracolic gutter near carter stoma, exiting on left.

Closure: Fascial closure with x3 loop PDS and interrupted PDS sutures. Please refer to plastics op note for details
Perineal closure: 2'0 Vicryl
Skin: Clips

Post operatively:

1. No enoxaparin tonight
2. Continue Abx
3. High risk of ileus, keep NG on free drainage and 4 hourly aspirate
4. Stoma nurse review tomorrow
5. Remove stoma bridge in 5 days
6. Bandar stents to stay in for 2 weeks
7. CT urogram with delayed phase in 6 weeks, as per urology op note, + OP follow-up (see op note)
8. No specific mobility or positioning restrictions from a plastics/perineum point of view.
9. Splenectomy protocol and vaccinations

Example Urology operation note for ileal conduit

The ureters are divided at the level of the iliac bifurcation

A 35cm section of ileum is isolated from the rest of the ileum with its mesentery, 25cm from the ileocaecal valve

The ureters are spatulated and anastomosed in an end to side fashion around Bander stents

The ileum is spouted usually in the RIF

Post operatively: daily creatinine check, send drain fluid for creatinine on day 3-4 post op, Bander stents to remain in situ for 2 weeks

Example Plastics operation note for IGAP flaps

Bilateral groin clearance and sartorius switch, bilateral external iliac lymph node clearance, bilateral IGAP reconstruction for perineal defect

Bilateral groin: Bilateral groin dissection performed, specimen sent for histology

Femoral vessels identified and preserved

Sartorius switch performed bilaterally

Topical TXA on wound followed by erythromycin powder to bilateral groin wounds. 1 x 16Fr Redivac drain into each groin.

Skin closed in layers with vicryl 3/0 and monocryl 3/0

Bilateral external iliac nodes: approached via laparotomy wound. External iliac nodes identified bilaterally and removed.

Laparotomy closed by general surgery team

Perineal wound: Anterior aspect of perineal wound closed in layers with vicryl 3/0, monocryl 3/0 and prolene 3/0. Patient turned to prone position. Bilateral IGAP flaps designed and raised. Left IGAP flap advanced 11cm into the pelvic wound, medial aspect de-epithelialized and secured with vicryl 3/0 to achieve waterproof coverage of pelvic content. Right IGAP flap advanced 7cm and closed double breasted. 2 x 10Fr Redivac drains inserted into each side of gluteal wound. Wound closed in layers with vicryl 3/0, monocryl 3/0.

Incisional VAC applied onto posterior pelvic wound and extended anteriorly onto groin wounds

Post operatively:

To ITU

No pressure on back flaps for 6 weeks

Reposition patient every 2-4 hours with documentation

DO NOT break the bed

Drains (7 in total), strict output monitoring, to stay in until discharge or discussion with plastics team

Dressings: keep VAC on until day 7 minimum. Ensure it is changed, on and working

Flap observations once per shift

Suture remove 14-16 days

Useful resources and references

1. Behind the knife YouTube series - 4 episodes on pelvic exenteration
<https://www.youtube.com/watch?v=J5zzHPT7TRY>
2. Burns EM, Quyn A; Lexicon Collaboration of UKPEN and the ACPGBI Advanced Cancer subcommittee. The 'Pelvic exenteration lexicon': Creating a common language for complex pelvic cancer surgery. *Colorectal Dis.* 2023 May;25(5):888-896. doi: 10.1111/codi.16476. Epub 2023 Feb 15. PMID: 36660781.
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