

Post-operative drains

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James talks to Dr David Yeo about the management of post-op drains on the wards.

David Yeo completed his medical training at the University of Sydney after which he was an intern, resident and registrar at Royal Prince Alfred Hospital in Sydney. He completed four years of post-fellowship training. The first was at Royal Prince Alfred Hospital in Upper Gastrointestinal and Liver transplantation surgery followed by two years in Melbourne at the Austin Hospital where he worked as the Hepatobiliary and Liver Transplant fellow. He then travelled to the United Kingdom and completed a year of Hepatobiliary and liver Transplantation at St James' University Hospital in Leeds. He now works as a consultant Upper Gastrointestinal and Transplant surgeon at Royal Prince Alfred, the Mater and Strathfield Private Hospitals in Sydney.

Post-Operative Drains

With Dr David Yeo, Upper GI and Transplant Surgeon, at Royal Prince Alfred Hospital, the Mater and Strathfield Private Hospitals in Sydney, New South Wales, Australia

1. What is the purpose of a post-operative drain?

- Generally there are two broad purposes
 - To remove fluid - pus, blood, haemoserous fluid, bile or other noxious fluid that would cause a problem if left in place.
 - To characterise fluid - the fluid coming out gives an idea of what is going on inside. Blood in the drain can indicate bleeding, or for example bile in the drain after a gallbladder operation might suggest there is a problem with the biliary tract.

2. What is a post-operative drain?

- It is a tube, placed during an operation (although many drains are now placed radiologically) that is used to remove fluid.

3. What are the different types of drains?

- Drains can be open or closed
 - Closed - a tube system attached to a bottle. May have a belovac or redivac drain. Tends to be associated with less infection as it is not exposed to the air. Often placed after elective surgery to prevent the build up of fluid which can get infected.
 - Open - corrugated drain or a flat drain. Can look quite primitive - simply facilitates the movement of fluid out of the space. Often placed to drain infection.
- And they can be active or passive
 - Active - suction, creates negative pressure.
 - Passive - simply uses the difference between pressure in the drained space versus that outside the body to facilitate fluid removal..

4. If a junior doctor needs to work out what kind of drain is in place, how should they do that?

- Look at the operation report or the radiology report. Usually the report will list what was placed where.
- Be careful, tubes which may appear to be drains can have other purposes. There can be PTCs or gastrostomies, or tubes into which things are being administered. It is important that these are recognised and not accidentally removed.

Case - You are asked to review a 55 year old female. Day 1 post op from a laparoscopic cholecystectomy. The nursing staff are concerned that there is some coloured output from the drain.

1. Initial questions over the phone?

- The first question is how well the patient is.
 - If they are unwell for any other reason it is important to go and see them as soon as possible.
- If they are well and the nurse's primary concern is the drain:
 - What has come out over the preceding 24 hours or since the operation
 - Volume
 - Colour

- In this case it would be very important to know if there was any yellow or green fluid coming out as it could indicate a bile leak.
 - Brown or faeculent material could indicate a bowel injury. This should prompt an escalation to the surgical registrar or the registrar on the team.
- Why was the drain left in the first place?
 - This may have to wait until you reach the ward.
 - Drains are usually left for a reason
 - Was it a difficult operation?
 - Was the team concerned about infection?

2. Outline your assessment approach by the bedside.

- Get a general idea of how they look
 - Hypotensive, tachycardic, febrile, saturating ok?
 - Writhing around in pain
- What's in the drain?
 - Colour
 - Volume
 - Consistency
- Examine the abdomen
 - Can be difficult to assess when someone has had recent surgery
 - Assess for peritonism
 - May indicate a leak into the abdomen which may necessitate a trip back to the operating theatre

3. What are some of the common complications related to surgical drains?

- You may be asked about a possible infection around the site of the drain
 - A very common reason to be called
 - Very rare to be infected at the site, but you can get scarring or scabbing at the site, which is usually nothing to worry about
- The drain has dislodged
 - Look at why the drain was in place and what has been draining

- If it had drained a litre yesterday and now nothing - that is very concerning
- Assess the clinical state of the patient. If they are unwell, there may be fluid contaminating the space the drain was originally draining. It is very important to escalate this to a senior colleague like the surgical registrar.

4. What should be put in the daily medical notes

- Volume over the past 24 hours, and how that relates to previous drained volumes
- What colour
 - Haemoserous is generally reassuring
 - Yellow, green, feculent etc can be worrying

5. Do you ever send off the drain fluid for testing?

- Yes, there are specific tests depending on where the leak could be originating from
 - For example, post Whipple's a bilirubin and amylase can be sent off
 - These are then compared to the serum levels and can direct whether the drains can be removed
 - If there has been surgery near the ureters or bladder, a drain creatinine can also be sent off to check for a urine leak
- Drain fluid can be sent off for culture
 - However, the results can be difficult to interpret as the drains become colonised from the outside
 - Radiologically drained collections are routinely sent off for culture initially, usually under sterile conditions so are more reliable

6. What influences the decision to put a drain on free drainage vs suction?

- Very surgeon dependent, with little consistency between surgeons (so take direction from the seniors in your team)
- Suction more effectively evacuates a space
 - If that is the purpose of a drain that's the best way to do it

- However some people believe that leaving a drain on suction can promote the formation of fistulae by encouraging flow out of transected margins e.g. post liver resection.
- Free drainage
 - Relying on the differences in pressure

7. Do all patients require antibiotics while the drain is in place?

- Antibiotics are often given around the time that a drain is placed, however the presence of a drain alone does not always mandate the use of antibiotics

8. What determines when a drain should come out?

- Some are routinely left for a specific length of time
- Other times waiting for fluid quantity or quality to change
- Seek direction from a senior team member

9. Are all drains sutured in?

- Most drains are sutured in, but not all
- Some radiological drains are held by clipped fixation devices
- If drains are being shortened they are often fixed with safety pins to prevent the drain being sucked into the, for example, abdominal cavity.

10. After a drain has been removed, how do you care for a drain site?

- It can be thought of similar to an infected wound
- Skin bugs will have been able to superficially infiltrate the wound
- So you do not generally want to suture the wound closed
 - An exception is a chest drain, to prevent the formation of a pneumothorax
- A simple dressing over the top for a few days is generally sufficient

Take home messages

- Lots of tubes that look like drains are in fact not, and these are important to identify
 - If there is any ambiguity about which is the drain to come out, no one will mind being asked

Never trust a drain - if you suspect that someone is bleeding or has a leak, but there is nothing in the drain you shouldn't take that to mean that they aren't/don't. It only indicates that whatever is going on isn't occurring near the internal opening of the drain. It may be that the drain is in a separate cavity and the blood isn't reaching it, or that it is occluded with blood or viscera. In this case the drain can only be trusted as a positive sign not a negative one.

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