Norfolk and Norwich University Hospitals NHS Foundation Trust

James Paget University Hospitals NHS Foundation Trust

# Joint Trust Guideline for the Management of Therapeutic Paracentesis in Adult Cirrhotic Patients

**A clinical guideline recommended**

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| **For use in:** | Adult medical wards |
| **By:** | Medical staff, nursing staff |
| **For:** | Adult patients with ascites due to liver cirrhosis |
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**Version Information**

| Version No | Updated By | Updated On | Description of Changes |
|---|---|---|---|
| JCG0044 v1 | THCGAP | 01 October 2014 | Change of header and reference to joint hospital version. |
| JCG0044 v2 | THCGAP | 31 January 2017 | No clinical changes. |
| JCG0044 v2.1 | CGAP | 30 January 2020 | No clinical changes. |

## Objective/s

The objective is to help improve the practice and safety of therapeutic paracentesis within the Trust. These guidelines are not intended to be a substitute for careful clinical judgement by an experienced clinician

## Rationale

Therapeutic paracentesis has been shown to be a useful intervention in cirrhotic patients with refractory or tense ascites. However, the procedure is associated with potentially serious complications. These guidelines include practical guidance for junior medical and nursing staff on the procedure of therapeutic paracentesis. They draw attention to the potential problems of therapeutic paracentesis and make recommendations on how these can be minimised. They are based on a recently published consensus conference report from the International Ascites Club[4] and other published international guidelines.

## Broad recommendations

The development of ascites in a patient with cirrhosis is a serious prognostic indicator – approximately 50% of these patients die within 2 years – and is one of the indicators used for considering assessment for liver transplantation. Small volume ascites can be successfully managed with reduction in alcohol consumption, salt restriction and diuretic therapy (with spironolactone +/- furosemide). Once ascites becomes refractory to medical therapy, mortality is 50% by 6 months and 75% by 12 months.

## Potential complications of therapeutic paracentesis

1. Abdominal wall haematoma (approximately 1% of cases).
2. Coagulopathy induced by loss of clotting factors in the ascites.
3. Bacterial peritonitis via the drainage catheter.
4. Hypovolaemia with hypotension.
5. Acute renal dysfunction.
6. Hepatorenal syndrome.

<u>Indications for therapeutic paracentesis</u>

1. Tense painful ascites.
2. Respiratory embarrassment secondary to “splinting” of the diaphragm.
3. Hepatic hydrothorax. This is usually a right pleural effusion associated with

significant ascites via a diaphragmatic defect.

4. Decompression of abdominal tamponade secondary to ascites. This is usually done in patients with acute renal failure in order to decompress the renal veins. In this situation only 2-4 litres should be removed to achieve decompression and avoid further renal problems from hypovolaemia.

**Contraindications to therapeutic paracentesis**

The only absolute contraindication to therapeutic paracentesis is clinically evident disseminated intravascular coagulation. Coagulopathy due to the underlying liver disease is not a contraindication. Relative contraindications to therapeutic paracentesis are:

1. Spontaneous bacterial peritonitis. Always do a diagnostic tap first. Therapeutic paracentesis in this situation is more likely to result in cardiovascular and renal dysfunction. Treat with intravenous (iv) antibiotics first for 5 days if possible.
2. Cardiovascular instability prior to paracentesis.
3. Renal dysfunction prior to paracentesis (e.g. serum creatinine >150μmol/L). In these patients large volume paracentesis (>6-8 litres) is likely to exacerbate renal dysfunction.
4. Severe thrombocytopenia (e.g. platelets <50,000/$mm^3$). Platelet transfusion just prior to therapeutic paracentesis is advisable.

**Factors to consider prior to therapeutic paracentesis**

1. Does the patient have early or advanced chronic liver disease? This is best measured using the Child-Pugh grade and is easy to do at the bedside (see appendix). Patients who are Child-Pugh grade A or B can usually tolerate very large volume paracentesis (with adequate colloid replacement) with little danger of serious cardiovascular/renal consequences. However, Child-Pugh grade C patients tolerate very large volume paracentesis less well. The median volume removed in the large trials of paracentesis were only 4-6 litres and the majority of patients were not C-P grade C. However, data from one paper suggests that total paracentesis is safe in all patients with tense ascites as long as adequate colloid replacement follows[1]. In this trial 38 patients underwent total paracentesis with Human Albumin Solution (HAS) colloid replacement. There was a 13% complication rate but no patients developed renal dysfunction. The mean paracentesis volume was 10.7 litres. However, the trial participants were carefully selected to exclude those with encephalopathy, gastrointestinal bleeding, sepsis, severe jaundice (bilirubin >170μmol/L), coagulopathy (INR>1.25), thrombocytopenia (platelets <40), or renal failure (creatinine > 280μmol/L). The mean Child-Pugh grade was B. Therefore, the trial patients had less severe liver disease and fewer complications than those frequently needing therapeutic paracentesis in common clinical practice.
2. Is there any peripheral oedema? Patients with peripheral oedema generally tolerate paracentesis better than those without peripheral oedema.
3. Which colloid fluid replacement should be used? This is a very controversial issue. 20% Human Albumin Solution (HAS) has historically been the colloid of choice but is very expensive and the evidence base for efficacy is thin. Current

advice is that other colloids (4.5% HAS or Voluven solutions) can be used safely instead for small volume paracentesis (<5 litres). For larger volume paracentesis HAS is recommended as colloid replacement.

**The technique of therapeutic paracentesis**

1. Site the drain in the right or left iliac fossa[3].
2. Avoid previous appendicectomy or laparotomy scars (the bowel may be directly adherent to the abdominal wall).
3. Use aseptic technique to prepare the area.
4. Infiltrate the abdominal wall with 1% or 2% lidocaine until ascites is aspirated.
5. Use a scalpel to make a very small incision to break the skin for the drain.
6. Insert the drain. A Bonano catheter (originally designed as a suprapubic urinary catheter) is the easiest to use, but other suitable catheters are available. In an urgent situation, a large bore venflon adequately secured with gauze and tape works just as well. There is no need to suture the drain in but do ensure that it is well taped down.
7. Attach the drain to a drainage bag. A 2 litre urine bag is often the best. Leave on free drainage at all times unless there is cardiovascular instability.
8. Insert venflon for iv colloid replacement therapy. This need not be given immediately, but should ideally be given within a few hours AFTER paracentesis. There is data to suggest that 50% of the colloid replacement is best given immediately AFTER paracentesis and the other 50% about 6 hours later. However, it is usually not forgotten if prescribed at the same time as inserting the drain and started whilst drainage is in progress. For HAS the recommended dose is 8g HAS for each litre of ascites removed. This works out as follows:

| Colloid | Volume of colloid needed |
|---|---|
| 20% HAS | 100mL for each 2.5 litres ascites removed. |
| 4.5% HAS | 500mL for each 3 litres ascites removed. |

   For other colloids it may be best to give 500mL for each 2 litres ascites removed, but this depends on the patient and the colloid used.
9. Liase with nursing staff on fluid regimen (above) and observations required. This should ideally be pulse, BP, and respiratory rate every 30 minutes and urine output hourly during paracentesis. Any concerns should be notified immediately.
10. Suggest a target volume to be removed (e.g. 8 - 10 litres).
11. Specify how long the drain is to remain in situ. This should be for a maximum of 6 hours to reduce the risk of infection. Specify that the nurse may remove the drain.
12. The drain site often leaks ascitic fluid for several days. This can usually be dressed with a simple gauze bandage. Occasionally adherent colostomy-type bags are needed for a few days. Excessive losses may need to be replaced

with iv fluids (preferably colloids).

**Problems after the drain has been inserted**

1. Bowel contents in the drainage bag. Contact senior doctor. Usually best to remove the drain immediately. A surgical opinion may be required.
2. Blood in the drainage bag. Often an abdominal wall vein is damaged during insertion. This usually clears after a few minutes. If it does not clear, an abdominal wall varix may have been ruptured during insertion. If the patient is unwell or cardiovascularly compromised contact senior doctor for advice. If there is persistent frank blood a surgical opinion may be required.
3. Hypotension. If severe, clamp off the drain and resuscitate with colloids.
4. Oliguria. Increase colloid fluid replacement. Remove the drain.
5. Dyspnoea. Check for clinical signs of fluid overload. Consider stopping iv colloids and giving iv furosemide.
6. Abdominal pain in the days after paracentesis. If ascites still present, do a diagnostic tap to exclude bacterial peritonitis.

**After therapeutic paracentesis**

1. After large volume paracentesis ensure that there is no serious cardiovascular compromise and that the patient is still passing urine.
2. Ensure the patient remains on a low salt diet (preferably <90mmol sodium/day).
3. Start or restart diuretic therapy to prevent reaccumulation of ascites. This should comprise spironolactone 100 - 400mg once daily +/- furosemide 40 -160mg once daily according to response as tolerated. U&Es must be monitored regularly.

**Distribution list / dissemination method**

Via Trust Internet

**References / source documents**

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