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

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JCG0044 v1	October 2014	Consultant Gastroenterologist	Change of header and reference to joint hospital version.
JCG0044 v2	January 2017	Consultant Gastroenterologist	No clinical changes.
JCG0044 v2.1	January 2020	Consultant Gastroenterologist	No clinical changes.
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Previous Titles for this Document:

Previous Title/Amalgamated Titles	Date Revised
None	Not applicable

Note which Trust, where applicable.

Distribution Control

Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet.

Consultation

The following were consulted during the development of this document:
Mark Sheppard, Divisional Operational Director, Medicine
Dr Anups DeSilva, Consultant Gastroenterologist JPUH

Monitoring and Review of Procedural Document

The document owner is responsible for monitoring and reviewing the effectiveness of this Procedural Document. This review is continuous however as a minimum will be achieved at the point this procedural document requires a review e.g. changes in legislation, findings from incidents or document expiry.

Relationship of this document to other procedural documents

This document is a clinical guideline applicable to Norfolk and Norwich University Hospitals (NNUH) and James Paget University Hospitals (JPUH); please refer to local Trust's procedural documents for further guidance.

Guidance Note

This guideline has been approved by the NNUH's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document**.**

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1. Introduction

1.1. Rationale

Therapeutic paracentesis has been shown to be a useful intervention in cirrhotic patients with refractory or tense ascites[1-3]. 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], BSG guidelines on the management of ascites in cirrhosis[5], and other published international guidelines.

1.2. Objective/s

The objective of this clinical guideline 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.

1.3. Scope

This document explains the procedure of therapeutic paracentesis for junior doctors performing the procedure on gastroenterology and other medical wards, as well as providing information for nursing staff looking after the patients undergoing this procedure. This document is intended for adult patients (>18 years of age) with decompensated cirrhosis specifically. Therapeutic paracentesis can be performed for other groups of patients such as those with severe congestive cardiac failure or intra-abdominal malignancies complicated by tense ascites. Whilst the procedure is identical for these patients, the aftercare is different.

1.4. Glossary

The following terms and abbreviations have been used within this document:

Term	Definition
NNUH	Norfolk and Norwich University Hospitals
JPUH	James Paget University Hospitals
CGAP	Clinical Guidelines Assessment Panel
HAS	Human Albumin Solution
U&Es	Urea and electrolytes
BP	Blood pressure
IV	Intravenous
EIA	Equality Impact Assessment

2. Responsibilities

Medical staff: ensure appropriateness of procedure, obtain patient consent and perform paracentesis

Nursing staff: help in preparation of equipment required for paracentesis, management of drain and observations following procedure, inform medical staff if any clinical concerns about the patient post-procedure

3. Processes to be followed

3.1. 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.

3.2. 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.
7. Perforation of the bowel.

3.3. Indications for therapeutic paracentesis

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.

3.4. 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 >150micromol/L). In these patients large volume paracentesis (>6-8 litres) is likely to exacerbate renal dysfunction.

3.5. 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 >170micromol/L), coagulopathy (INR>1.25), thrombocytopenia (platelets <40), or renal failure (creatinine > 280micromol/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.
4. Patients should give informed written consent prior to therapeutic paracentesis.
5. Ultrasound guidance should be considered if available to reduce the risk of adverse events.
6. Routine measurement of INR/PT or platelet count and infusion of blood products is not recommended prior to therapeutic paracentesis.

3.6. 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 peritoneal or suprapubic catheter is the easiest to use. 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. Liaise 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. Ongoing leaking from a paracentesis site can be managed with Histoacryl glue application, or usually best with a deep stitch to the abdominal wall site. Excessive losses may need to be replaced with iv fluids (preferably colloids).

3.7. 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.

3.8. 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.

4. Training & Competencies

IMT training at NNUH includes a procedures training day which includes therapeutic paracentesis. Training in diagnostic and therapeutic paracentesis is given to all junior doctors during Gastroenterology posts. Trainees are supervised performing these procedures by more senior doctors until they are signed off as competent to perform the procedure.

5. References / source documents

1. Tito, L., Gines, P., Arroyo, V. *et al.* Total paracentesis associated with intravenous albumin management of patients with cirrhosis and ascites. Gastroenterology 1990; 98:146-151
2. Gines, P., Arroyo, V. Paracentesis in the management of cirrhotic ascites. Journal of Hepatology 1993; 17(Suppl 2): S14-18
3. Bataller, R. Gines, P., Arroyo, V. Practical recommendations for the treatment of ascites and its complications. Drugs 1997; 54:571-580
4. Moore, K., Wong, F., Gines, P. *et al.* The management of ascites in cirrhosis: report on the consensus conference of the international ascites club. Hepatology 2003; 38:258-266
5. Aithal GP, et al. Guidelines on the management of ascites in cirrhosis. Gut 2020;0:1–21

6. Monitoring Compliance

Compliance with the process will be monitored through the following:

Key elements	Process for Monitoring	By Whom (Individual / group /committee)	Responsible Governance Committee /dept	Frequency of monitoring
Continuous review of all complications related to therapeutic paracentesis	Review of relevant Datix reports with presentation as appropriate at GI clinical governance meeting	Hepatologists	Gastroenterology	3 monthly

The audit results are to be discussed at Gastroenterology departmental clinical governance meetings to review the results and recommendations for further action.

Then sent to department of medicine clinical governance department who will ensure that the actions and recommendations are suitable and sufficient.

7. Appendices

There are no appendices for this document.

8. Equality Impact Assessment (EIA)

Type of function or policy	New

Division	Medicine	**Department**	Gastro
Name of person completing form	Martin Phillips	**Date**	3rd November 2023

Equality Area	Potential Negative Impact	Impact Positive Impact	Which groups are affected	Full Impact Assessment Required YES/NO
Race	No	No	NA	No
Pregnancy & Maternity	No	No		
Disability	No	No	NA	No
Religion and beliefs	No	No	NA	No
Sex	No	No	NA	No
Gender reassignment	No	No	NA	No
Sexual Orientation	No	No	NA	No
Age	No	No	NA	No
Marriage & Civil Partnership	No	No	NA	No
EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?		NA		

- **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty**
- **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service**
- **The policy or function/service is assessed to be of high significance**

IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED

The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.