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Point-of-care ultrasound guided reduction of an incarcerated umbilical hernia

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The Visual Journal of Emergency Medicine

Submission Template

Overview

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1. Article Title

Point-of-care ultrasound guided reduction of an incarcerated umbilical hernia

2. Author(s)

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3. Keywords

Ultrasound, Bedside Ultrasound, Point-of-Care Ultrasound, Umbilical Hernia, reduction

4. Discussion

[This section is meant to put the case into the context of similar cases, to explain specific treatment decisions, and to share additional relevant information that is not included in the case presentation.]

5. Visual Case Discussion

A 56 year-old female presented to the Emergency Department (ED) with reoccurrence of an incarcerated umbilical hernia on a background of cirrhotic liver disease (Child Pugh B). She reported 6 hours of severe colicky umbilical pain with associated nausea, anorexia and irreducible mass. Her abdominal examination confirmed a firm 5cm umbilical mass that was mildly tender to palpation. This was identical to her presentation 2 months prior, with CT confirmation of incarcerated loops of small bowel within an abdominal wall defect, without strangulation. At that time, the general surgical team were unable to initially manually reduce, and she was admitted to the ward with eventual manual reduction the following morning without complication.

For this subsequent presentation, given the known pathology, a trial of manual reduction in the ED with application of cold packs and titration of intravenous fentanyl was unsuccessful. Point-

of-care ultrasound was then utilised to confirm the abdominal wall defect with entrapment of a dilated loop of small bowel with surrounding anechoic fluid. The defect was located using a high-frequency linear probe over the mass, scanning in both transverse and longitudinal planes. Graded sustained pressure with the probe was applied to the hernia in the direction of the defect using sonographic visualisation. Reduction of the hernia ensured with immediate relief to the patient (Figure 1). The patient was immediately discharged from the Emergency Department, circumventing radiology-performed imaging, inpatient admission and the potential need for high-risk emergency surgery.

The umbilicus is the second most common region for abdominal wall herniation and is more frequent in females.[1] Ascites is a risk factor for their formation due to increased intra-abdominal pressure, with up to twenty percent of cirrhotic patients developing an umbilical hernia.[2] This represents a particular group that faces a higher risk of morbidity and mortality from abdominal surgery. Although the body habitus and presence of ascites or inflammatory fluid hindered manual blind reduction of the hernia, it afforded an acoustic window, allowing for easy visualisation of the hernial sac and abdominal wall defect. This permitted real-time adjustment of graded pressure and direction to effectively guide reduction of the hernia. The use of point-of-care ultrasound in this instance aided successful umbilical hernia reduction, allowing discharge and avoidance of potential morbidity and mortality associated with emergency surgery and hospital admission.

6. Caption for Image(s) or Video(s)

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Figure 1: Video clip of point-of-care ultrasound-guided umbilical hernia reduction.

7. References

[1] N. Dabbas, K. Adams, K. Pearson, G.T. Royle. Frequency of abdominal wall hernias: is classical teaching out of date? J R Soc Med Sh Rep (2011) 2-5.

[2] J.C.U. Coelho, C.M.P. Claus, A.C.L. Campos, M.A.R. Costa, C. Blum. Umbilical hernia in patients with liver cirrhosis: A surgical challenge. World J Gastrointest Surg. 8(7) (2016) 476-482.

8. Questions and Answers with a Brief Rationale

True & false and / or multiple-choice questions

- **Tips:** The questions may address issues of etiology, clinical presentation, differential diagnosis, diagnostic testing, natural history of disease, risk factors, management / treatment, potential complications, patient disposition, or other subjects pertinent to pre-

hospital and hospital-based emergency medicine healthcare providers. [Additional question writing guidelines can be found here.](#)

- **Note:** You will have an opportunity to review the questions and answers before submitting your completed article. The questions and answers will not be a part of the final author proof. The questions will appear alongside your article in a test format.

Question 1

Question 1. All incarcerated umbilical herniae should be reduced in the Emergency Department

TRUE

FALSE

Answer

FALSE – Incarcerated herniae with clinical or radiological evidence of strangulation should not be reduced in the Emergency and should be emergently referred for surgical repair. Clinical features of strangulation include fever, tachycardia, vomiting and peritonism. Whilst ultrasound can be used to assess for vascularity, cross-sectional CT contrast imaging is the preferred medium and surgical consultation should be sought in cases where there is clinical suspicion of strangulation.

Question 2

Question 2. Which of the following is NOT a useful adjunct in the reduction of an incarcerated umbilical hernia?

- a) Ice pack
- b) Trendelenburg positioning
- c) Ultrasound
- d) Opioid analgesia
- e) Procedural sedation

Answer

b) Trendelenburg positioning

Application of ice or cold packs to the hernia site for a sustained period can help reduce oedema in the bowel wall and hernial sac.

Positioning the patient in 20 degrees Trendelenburg can be helpful in the reduction of groin herniae due to the inferior direction of herniation. Supine positioning is preferred in the abdominal wall hernia.

Ultrasound can be utilised to identify the abdominal wall deficit, guide reduction in the appropriate direction and demonstrate complete reduction of the hernia. It can also be used to identify alternate diagnoses prior to attempted reduction.

Opioid analgesia and procedural sedation can improve patient comfort and relaxation of the abdominal wall to facilitate manual reduction.

9. Conflict of Interest

None to declare

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Author Contributions

AG drafted the initial manuscript, contributed the images with patient consent, and approved the final manuscript for submission. PJS revised the manuscript and submitted the final manuscript.

Declaration – separately attached