ACADEMIC: ABSTRACTS

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Patch repair of congenital diaphragmatic hernia: review of current options

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Background

Posterolateral congenital diaphragmatic hernia (CDH) occurs in approximately 1 in 3000 births. Defect size determines the type of treatment required, with large defects requiring patch closure. Patch materials include polytetrafluoroethylene/Gore-Tex, and Surgisis. However, complications such as hernia reoccurrence are associated with certain materials used. The aim of this study was to explore novel solutions for patch development using new technology such as biofabrication.

Materials and Methods

A literature review was performed for patch repair for CDH with a focus on potential new patch materials: synthetic, biologic, or composite. Keywords used in the search included "congenital diaphragmatic hernia/CDH", "treatment for CDH", "biomaterials", "bioengineering", and "tissue engineering".

Results

Current CDH patch options include synthetic, biological, and composite materials. Use of the synthetic material Gore-Tex is associated with a CDH recurrence rate ranging from 4-21% while Surgisis has a higher recurrence rate estimated at 50%. However, these results are based on small samples. Potential candidate patch materials include ovine forestomach matrix (OFM) which has been used in other hernias, and thermoplastic polyurethane (TPU) and silicone composite both of which are fabricated to have similar properties to Gore-Tex. However, all three materials require further testing in animal studies before patient trials.

Conclusion

There is a need for continued development and assessment of CDH patch materials and biofabrication remains a promising solution. Current potential patches include OFM and TPU/silicone. Prospective studies are required to identify the 'ideal' patch for CDH repair.

The utility of IVC diameter for the assessment of hypovolaemic shock in adult trauma patients

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Background

Traumatic injury is a leading cause of death globally among those aged between 10 and 29 years. Hypovolaemic shock represents 25% of preventable deaths following injury. Current systems used to classify hypovolaemic shock are not suitable for a high-intensity trauma environment, or clinically accurate for assessing the degree of shock. Inferior vena cava (IVC) diameter is a demonstrated parameter of hypovolaemic shock in intensive care settings. However, its feasibility as a diagnostic parameter has not been assessed in a trauma reception setting.

Materials and Methods

This was a prospective cross-sectional study of adult trauma patients undergoing a FAST scan. A subxiphoid view was used to capture a long-axis image of the IVC. IVC diameter was measured 2 cm caudal to its confluence with the hepatic veins. The minimum diameter during inspiration and maximum diameter during expiration were recorded to calculate the collapsibility index. The time taken to record the measurements was also recorded.

Results

Twenty-three participants were recruited into the shocked and non-shocked groups. The median IVC diameters during inspiration and expiration were smaller in the shocked group (7.8 mm and 10.0 mm) than in the non-shocked group (13.7 mm and 17.2 mm). IVC measurements were successfully obtained in only 56% of participants, demonstrating that there were barriers to obtaining these measurements. These barriers included operator dependence from variation in clinicians' ultrasound experience, the presence of bowel gas and obese body habitus.

Conclusions

IVC measurements could not be reliably obtained, likely precluding this assessment from being feasible in a trauma reception environment.

Laparoscopic versus open approach for emergency repair of groin hernias: a systematic review and meta-analysis

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Background
Despite the historical preference for open repair over laparoscopic repair for acutely strangulated and incarcerated groin hernias, literature investigating the optimal approach is limited. This review explores the safety and clinical outcomes of laparoscopic and open groin hernia repair in the emergency setting.

Materials and Methods
PubMed, Embase, Scopus, Cochrane Library, and Web of Science were systematically searched for articles comparing outcomes between laparoscopic and open emergency groin hernia repair in adult patients. Primary outcomes included operative time, length of hospital stay, post-operative complications, recurrence, and reoperation. Secondary outcomes were post-operative mortality and the rate of conversion from laparoscopic to open repair.

Results
Thirteen articles with 40,199 patients were included. Laparoscopic repair resulted in shorter length of hospital stay (MD -2.23 days [95% CI -4.17, -0.28], $p = 0.032$), reduced risk of wound infection (RR 0.29 [95% CI 0.18, 0.45], $p < 0.001$], and lower reoperation rate (RR 0.663 [95% CI 0.46, 0.95], $p = 0.037$). No statistically significant differences were observed in operative time ($p = 0.272$), seroma formation ($p = 0.314$), respiratory complications ($p = 0.9880$), and recurrence ($p = 0.056$). In-hospital mortality ranged from 1.88% to 2.20% for open repair and 0% to 1.41% for laparoscopic repair. Conversion from laparoscopic to open repair occurred in 3.76% of patients ([95% CI 0.29, 34.11]).

Conclusions
Emergency laparoscopic repair of groin hernias results in shorter hospital stay and reduced post-operative morbidity, with comparable operative time to open repair. It appears to be a safe and feasible alternative to open repair in the acute setting.