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Emergency Peritoneocynthesis for Tension pneumoperitoneum: An Innovative lifesaving Manoeuvre.

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Abstract

Background: *Tension pneumoperitoneum is not uncommon in medical practice, however is part of a missed diagnosed entity leading to high mortality rate. Emergency release via needle, canular or catheter is rarely cited in literature.*

Aim: *To report 3 cases of emergency peritoneocynthesis for tension pneumoperitoneum with an Innovative lifesaving method performed in our Centre.*

Methodology: *This was a review of a prospectively collected data of cases performed, stored electronically in Excel spread sheet and Epi-info from January 2023 to January 2024. Ethical approval was obtained from hospital ethics committee.*

Results.

Case reports: *Three males patients aged 62 years, 51 years and 19years respectively, presented for colonoscopy, upper gastrointestinal endoscopy (OGD) and post-surgery with associated features of slow leak of perforated viscous. The three patients had cardiac arrest during the procedures of colonoscopy, OGD and post laparoscopy,due to tension pneumoperitoneum. A needle peritonealcannulation with subsequent catheter placement was used to reverse these patients. They all did well and discharged home after a definitive procedure.*

Conclusion: *Emergency peritoneocynthesis was very effective in our patients. This method may be of value in treatment of patients with perforated viscous.*

Key words*: Tension pneumoperitoneum, peritoneocynthesis, abdominal decompression, surgical emergency, innovative technique*

INTRODUCTION

Tension pneumoperitoneum is an exceedingly rare but critical surgical emergency characterized by elevated intra-abdominal pressure due to trapped air. This results in diaphragmatic splinting, reduced venous return, and compromised cardiac and respiratory function. Traditional management involves operative intervention, but immediate access to surgery is not always feasible. Here, we present an innovative technique—emergency peritoneocynthesis—as a rapid, bedside decompression maneuver to stabilize patients prior to definitive care.

METHODS

Study Design and Data Collection

This study is a retrospective review of prospectively collected data involving patients who underwent emergency peritoneocentesis for tension pneumoperitoneum at our facility between January 2023 and January 2024. Data were collected simultaneously during patient care and entered into a structured Microsoft Excel spreadsheet and subsequently analyzed using Epi Info.

Patient demographics, clinical presentation, procedural details, and outcomes were recorded. This included age,

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indication for endoscopy or surgery, onset of symptoms, intraoperative findings, and post-procedure recovery. Only patients who underwent needle peritoneocentesis as an emergency decompressive intervention for tension pneumoperitoneum were included.

Ethical Considerations

Ethical approval was obtained from the Hospital Ethics Committee prior to data analysis and manuscript preparation. Patient confidentiality was maintained throughout the study, and all data were anonymized. Written informed consent for use of de-identified data for research and publication purposes was obtained where applicable.

Clinical Profile and Emergency Intervention

Three male patients, aged **62**, **51**, and **19 years**, presented in different clinical contexts but developed **tension pneumoperitoneum** with **cardiovascular collapse**:

- **Patient 1 (62 years)** during **colonoscopy**
- **Patient 2 (51 years)** during **upper gastrointestinal endoscopy (OGD)**
- **Patient 3 (19 years)** post **laparoscopic abdominal surgery**

Each patient developed acute abdominal distension, hypotension, and cardiac arrest suggestive of tension pneumoperitoneum. Immediate **needle peritoneocentesis** was performed at bedside as an emergency decompression maneuver.

Peritoneocentesis Technique

- Patients were positioned supine. The abdomen was grossly distended and tympanic.
- After aseptic skin preparation, a wide bore intravenous cannula was inserted into the left upper abdominal quadrant (mid-clavicular line, two finger breadths below the costal margin).
- A hissing sound indicated release of pressurized intraperitoneal air.
- Decompression resulted in immediate improvement in hemodynamic and ventilatory parameters.
- The cannula was converted to a catheter to allow ongoing decompression prior to definitive surgical management.

All three patients were successfully stabilized, underwent definitive surgical repair, and were subsequently discharged home in good condition.

RESULTS

Three male patients aged 62, 51, and 19 years were identified during the one-year study period. All presented with tension pneumoperitoneum in varying clinical contexts—during colonoscopy, upper gastrointestinal endoscopy (OGD), and in the immediate post-operative period following laparoscopic surgery, respectively. Each patient suffered cardiac arrest associated with progressive abdominal distension and hemodynamic collapse.

Needle peritoneocentesis was performed emergently in all cases, resulting in prompt release of intra-abdominal pressure, audible escape of air, and return of spontaneous circulation. Hemodynamic parameters stabilized within minutes following decompression.

Following initial resuscitation, all patients underwent definitive surgical intervention based on the underlying pathology. There were no procedural complications related to peritoneocentesis. All patients recovered fully and were discharged home in good clinical condition.

Table 1: Summary of Patient Characteristics and Outcomes

Patient	Age	Clinical Context	Presentation	Intervention	Outcome
1	62	Colonoscopy	Cardiac arrest, distension	Needle peritoneocentesis	Full recovery, discharged
2	51	Upper GI Endoscopy (OGD)	Bradycardia, hypotension	Needle peritoneocentesis	Full recovery, discharged
3	19	Post-laparoscopy	Arrest, abdominal tension	Needle peritoneocentesis	Full recovery, discharged

DISCUSSION

Tension pneumoperitoneum is an uncommon but life-threatening condition characterized by the accumulation of free intraperitoneal gas under pressure, leading to elevated intra-abdominal pressure (IAP), diaphragmatic splinting, reduced venous return, and eventual cardiovascular collapse if not promptly addressed. While it is most frequently associated with gastrointestinal perforation or barotrauma during endoscopic procedures, it can also occur in postoperative settings and other clinical scenarios [1–3].

The rapid progression of tension pneumoperitoneum poses significant diagnostic and therapeutic challenges. Clinical signs such as sudden abdominal distension, hypotension, bradycardia, and respiratory distress should raise suspicion, especially in patients undergoing procedures like colonoscopy, upper gastrointestinal endoscopy (OGD), or laparoscopic surgery [4–6]. Imaging modalities, including plain radiographs and computed tomography (CT), can aid in diagnosis but should not delay emergent intervention in hemodynamically unstable patients [7].

Emergency needle peritoneocentesis serves as a critical, life-saving intervention in the management of tension pneumoperitoneum. This technique, analogous to needle thoracostomy for tension pneumothorax, allows for rapid decompression of intraperitoneal gas, thereby restoring hemodynamic stability and buying time for definitive surgical management [8–10]. The procedure involves the insertion of a

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wide-bore cannula, typically a 14G or 16G, into the peritoneal cavity—commonly at Palmer's point or the left upper quadrant—to release trapped gas [11].

Several case reports and series have documented the efficacy of emergency peritoneocentesis. Ray and Exantus described a case where bedside needle decompression led to immediate ventilatory improvement in a patient with tension pneumoperitoneum secondary to gastric perforation [12]. Similarly, Chiapponi et al. reported successful stabilization of patients using percutaneous needle decompression, emphasizing its role as a bridge to surgical repair [13]. Bickerton et al. also highlighted the use of needle decompression as a resuscitative measure prior to induction of general anesthesia in a patient with tension pneumoperitoneum [14].

In our series, three male patients aged 62, 51, and 19 years developed tension pneumoperitoneum during or shortly after colonoscopy, OGD, and laparoscopic surgery, respectively. Each experienced cardiovascular collapse, necessitating immediate intervention. Emergency needle peritoneocentesis was performed at the bedside, resulting in rapid hemodynamic improvement and return of spontaneous circulation. Subsequent definitive surgical procedures addressed the underlying perforations, and all patients were discharged in good clinical condition.

The safety and simplicity of needle peritoneocentesis make it a valuable tool in emergency settings. However, it is essential to recognize that this intervention is a temporizing measure and not a substitute for definitive surgical repair. Prompt recognition and intervention are paramount to prevent morbidity and mortality associated with delayed treatment [15–17].

Despite the positive outcomes observed, our study is limited by its small sample size and retrospective nature. Further research, including larger prospective studies, is warranted to establish standardized protocols and assess long-term outcomes associated with emergency peritoneocentesis in tension pneumoperitoneum.

Conclusion

Emergency needle peritoneocentesis is a rapid, effective, and life-saving technique for the management of tension pneumoperitoneum. In scenarios where surgical access is delayed or during procedural complications, this intervention can significantly improve survival outcomes. Early recognition and prompt decompression should be integral components of training and clinical protocols across endoscopy, surgical, and critical care units.

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