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## **Pelvic ring injuries with haemodynamic instability: efficacy of pelvic packing, a systematic review**

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### **CRD summary**

The authors concluded that pelvic packing could potentially aid in early intrapelvic bleeding control and provide crucial time for a more selective management of haemorrhage. The review had some methodological problems and the authors' conclusions were based on the results of three small case series of low to moderate quality, which limits the reliability of the authors' findings.

### **Authors' objectives**

To assess the role of pelvic packing as an emergency intervention in pelvic fractures with concomitant haemodynamic instability.

### **Searching**

PubMed, EMBASE, and the Cochrane Library were searched during the last two decades (specific dates not reported) for articles in English. Search terms were reported. Bibliographies of retrieved articles were also searched.

### **Study selection**

Studies of pelvic packing in polytrauma patients with pelvic ring injuries and concomitant life-threatening haemorrhage were eligible for inclusion. Primary outcomes of interest were early mortality (within 24 hours of injury), late mortality (within the first month), rates of infection and rates of multiple organ failure. Studies had to adequately describe pelvic packing and had to include information on mortality or complication rates. Studies were excluded if they were case studies, reviews, in paediatric populations, or if the pelvic packing was for non-traumatic cases.

The included studies examined transperitoneal or direct retroperitoneal pelvic packing. The mean age of participants ranged from 40 to 45 years. The injury severity score ranged from 41.2 to 55.

Two reviewers independently performed study selection; disagreements were resolved by consensus.

### **Assessment of study quality**

Two reviewers independently assessed quality using a self-designed questionnaire that evaluated the following criteria: study design, inclusion and exclusion criteria; description of outcomes of interest; details of data which may have affected outcomes of interest. The maximum score was 9.

### **Data extraction**

Data on mortality and complications were extracted and used to calculate proportion of events and 95% confidence intervals (CIs).

The authors did not state how many reviewers extracted the data.

### **Methods of synthesis**

The pooled proportion of events, together with 95% confidence intervals, was estimated using inverse variance meta-analysis. Statistical heterogeneity was assessed using the Cochrane Q statistic and  $I^2$ .

Subgroup analysis was also undertaken based on the type of pelvic packing, i.e. direct extraperitoneal versus transabdominal.

### **Results of the review**

Three case series were included in the review (n=66 participants): two prospective and one retrospective. The sample size of included studies ranged from 18 to 28 participants. The quality score ranged from 5 to 7 out of 9. The studies were graded as low to moderate quality. There was no evidence of statistical heterogeneity in any of the analyses.

**Mortality** (three studies; n=66 participants): The pooled overall mortality for pelvic packing was 28% (95% CI 16.8 to 39.4). The pooled rate of early mortality was 10% (95% CI 3 to 18) and the pooled rate of late mortality was 13% (95% CI 5 to 22).

**Complications** (three studies; n=66 participants): In two studies (n=46 participants), the pooled infection rate with pelvic packing was 35% (95% CI 21 to 48). In three studies (n=66 participants), the pooled multiple organ failure with pelvic packing was 9% (95% CI 2 to 16).

In the subgroup analyses, the overall mortality rate was 10% higher in the transabdominal patients (one study) compared with the extraperitoneal patients (two studies), but the rates of multiple organ failure were similar (9% versus 7%).

### Authors' conclusions

Pelvic packing, as part of a damage control protocol, could potentially aid in early intrapelvic bleeding control and provide crucial time for a more selective management of haemorrhage.

### CRD commentary

Inclusion criteria for the review were broadly defined and several relevant databases were searched. There was the potential for both publication bias and language bias, as the search was restricted to published articles in English. Two authors independently undertook study selection and quality assessment, which should have minimised error and bias. The authors did not state how many reviewers performed data extraction, which may have increased the potential for error and bias in the analysis.

Validity assessment was undertaken using a tool designed by the authors and included some relevant criteria. Studies were combined using the inverse variance method, as statistical heterogeneity was not found to be present in any of the analyses.

Overall, the review had some methodological weaknesses and the authors' conclusions were based on the results of three small case series of low to moderate quality, which limits the reliability of the authors' findings.

### Implications of the review for practice and research

The authors did not state any implications for practice or further research.

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### Bibliographic details

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.