BET 2: STABILISATION OF PELVIC FRACTURES

Report by: David Clarke, *St5 Emergency Medicine*

Search checked by: Michael Stewart, *St5 Emergency Medicine*

Institution: Stepping Hill Hospital, Stockport, UK and Blackpool Victoria Hospital, Blackpool, UK

ABSTRACT

A short-cut review was carried out to establish whether pelvic immobilisation with a T-POD, or similar device, or pelvic immobilisation with a wrapped sheet is better at fracture stabilisation. Three papers were relevant to the question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results and study weaknesses of these papers are shown in table 2. The clinical bottom line is that these devices/techniques do reduce and stabilise some fractures, whether one device is better than another is unclear.

THREE-PART QUESTION

In (trauma patients with unstable pelvic fractures) is (pelvic immobilisation with a T-POD, or similar device, or pelvic immobilisation with a wrapped sheet) better (at fracture stabilisation)?

CLINICAL SCENARIO

A patient is bought to the emergency department with pelvic trauma. One of the members of the trauma team mentions that the new T-POD pelvic binder is better than the traditional wrapped sheet for fracture stabilisation. You wonder if there is any evidence to support this.

SEARCH STRATEGY

Medline 1980–May 2011 using the NHS library interface. [[Pelvis ti.ab OR Pelvic ti.ab] AND [Splint ti.ab. OR immobilisation ti.ab.] AND [Trauma ti.ab]] OR [Tpod ti.ab] Medline 1980-February 7th 2013 using NHS Evidence (TPOD ti,ab OR T-POD.ti,ab OR trauma pelvic orthotic device.ti, ab)=13 records Embase 1980-Feb 7th 2013 15 records no new relevancies The Cochrane Library issue 1 of 12 Jan 2013 TPOD ti,ab OR T-POD.ti, ab OR trauma pelvic orthotic device.ti, ab 2 records no new relevancies.

SEARCH OUTCOME

This search yielded 19 papers. No paper directly answered the question. A systematic review and two subsequent studies seemed relevant to the question and their results are presented.

COMMENTS

Historically, patients with unstable pelvic fractures and haemodynamic instability have had mortality rates of 40–80% (Geeraerts *et al*, 2007). The application of external fixators or C clamps may stabilise the fracture(s), but this requires appropriate equipment and training and has prompted the development of alternative non-invasive techniques such as wrapping a circumferential sheet around the pelvis and pelvic circumferential compression devices. The studies cited suggest that these can achieve reduction of horizontal displacement. However, there is a suggestion that pressure on the skin is sufficient to cause tissue damage if the devices are left on for more than 2–3 h (Jowett and Bower, 2007).

Clinical bottom line

Non-invasive pelvic stabilisation measures are widely advocated in the resuscitation of patients with unstable pelvic fractures. Cadaver and clinical studies do suggest that they can reduce pubic symphysis diastasis. Local guidelines should be followed about which technique/device to use.

- **Spanjersberg WR**, Knops SP, Schep NWL, *et al*. Effectiveness and complications of pelvic circumferential compression devices in patients with unstable pelvic fractures: a systematic review of literature. *Injury* 2009;**40**:1031–5.
- **Tan ECTH**, van Stight SFL, van Vught AB. Effect of a new pelvic stabilizer (T-POD) on reduction of pelvic volume and haemodynamic stability in unstable pelvic fractures. *Injury* 2010;**41**:1239–43.
- **Geeraerts T**, Chhor V, Cheissong, *et al*. Clinical review: initial management of blunt pelvic trauma patients with haemodynamic instability. *Critical Care* 2007;**11**:204.
- **Knops SP**, Schep NWL, Spoor CW, *et al*. Comparison of three different pelvic circumferential compression devices: a biomechanical cadaver study. *J Bone Joint Surg Am* 2011;**93**:230–40.
- **Jowett AJ**, Bower GW. Pressure characteristics of pelvic binders. *Injury* 2007;**38**:118–21.

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Table 2 Relevant papers

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Spanjersberg *et al*, 2009, The Netherlands	Clinical or experimental evaluations of PCCD or sheets	Systematic review	Reduction of horizontal displacement	One prospective clinical trial showed a PCCD significantly reduced horizontal displacement, comparable with definitive treatment. Cadaver studies have confirmed this effect on horizontal displacement. One study showed T-POD to be more effective than a sheet binder	Of the 17 articles cited 7 were case reports and 3 were expert opinions. One case–control study and one case series only evaluated the effect on transfusion requirement and haemodynamic effects, while one trial in healthy subjects evaluated skin pressure effects. Only the one trial and 3 cadaver studies assessed fracture reduction
Tan *et al*, 2010, The Netherlands	Patients presenting to the ED with an untreated unstable pelvic fracture Haemodynamic measurements (in 10 patients) and AP radiograph (in 12 patients) taken before and 2 min after application of T-POD	Prospective cohort	Symphyseal diastasis (mm)	41.7±8.6 before vs 12.4±1.7 after, p=0.01	Small numbers as 48 other patients had some form of stabilisation device applied pre-hospital No comparison with another device/technique
Knops *et al*, 2011, USA	16 Cadavers with 4 pelvic fracture types (tile A, tile B1 50 mm diastasis, B1 100 mm diastasis, tile C compressed by 3 devices (T-POD, pelvic binder, SAM sling) in random order	Biomechanical study	Symphysis pubis diastasis reduction in tile B1 and C fractures; mean±SEM (mm) Pulling force needed for closure of symphysis pubis diastasis in tile B1 and C fractures; mean ±SEM (N)	19.64±2.86 pelvic binder 18.18±2.25 SAM sling 20.11±2.87 T-POD difference between them p=0.213 43±7 T-POD 60±9 pelvic binder 112±10 SAM sling difference between then p<0.01	

ED, emergency department; PCCD, pelvic circumferential compression devices; T-POD, SAM sling and pelvic binder are all proprietary names.

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