SALA CONCORDIA C

PIANETA TRAUMA

Moderatori: **Geminiano Bandiera – Mario Rugna**

Cristian Lupi

Il trauma del bacino: ‘pelvic binders’, REBOA & altro

XII congresso nazionale
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IL TRAUMA DI BACINO:
PELVIC BINDER, REBOA & ALTRO

Cristian Lupi MD
Anaesthesia & ICU
HEMS
Trauma Center Maggiore Hospital
Bologna , Italy

XII congresso nazionale
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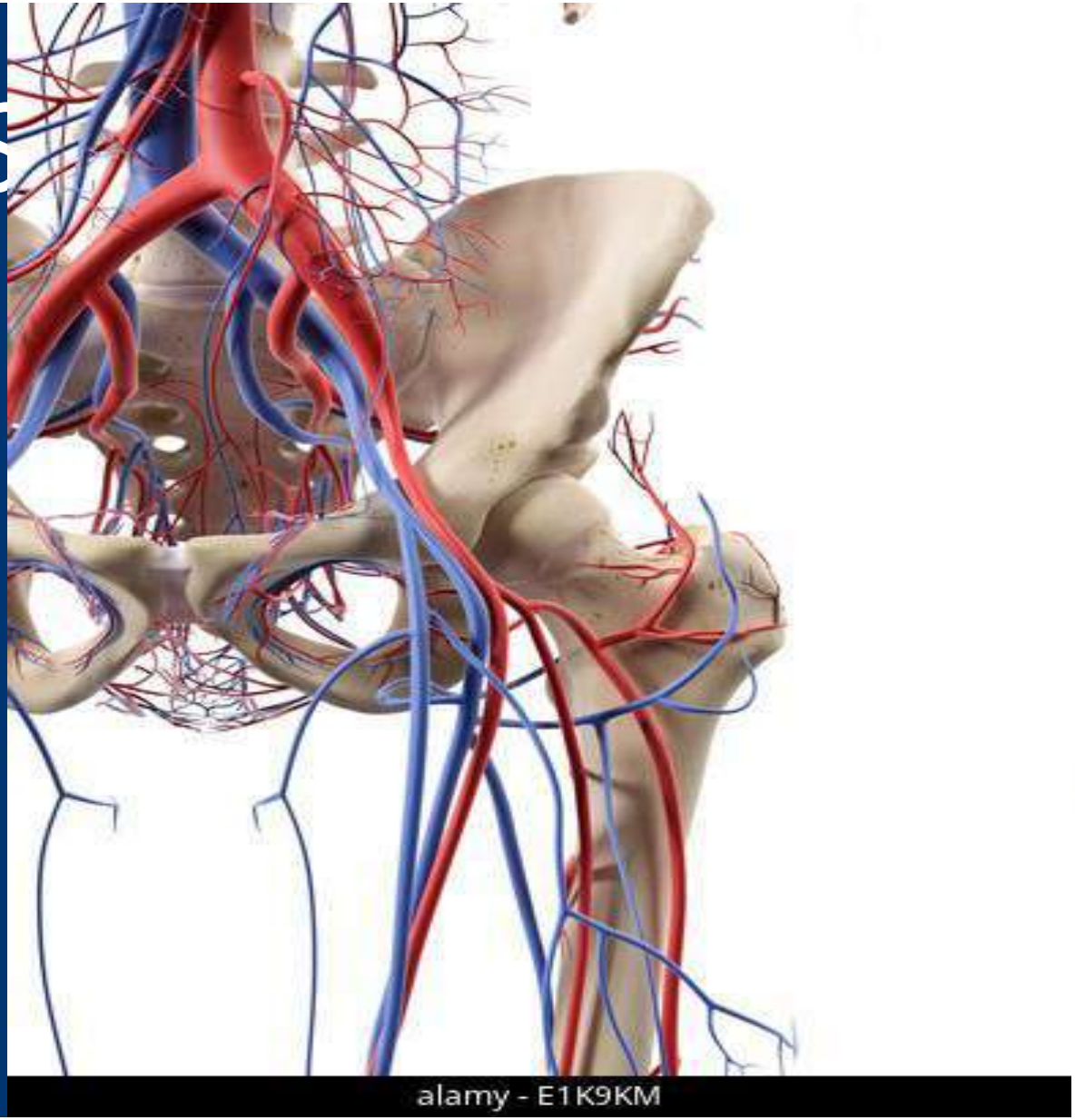
SIAARTI
PRO VITA CONTRA DOLOREM SEMPER

EUROPEAN RESUSCITATION COUNCIL

ATLS
ADVANCED TRAUMA LIFE SUPPORT

DISCLOSURE

LET'S ELVIS



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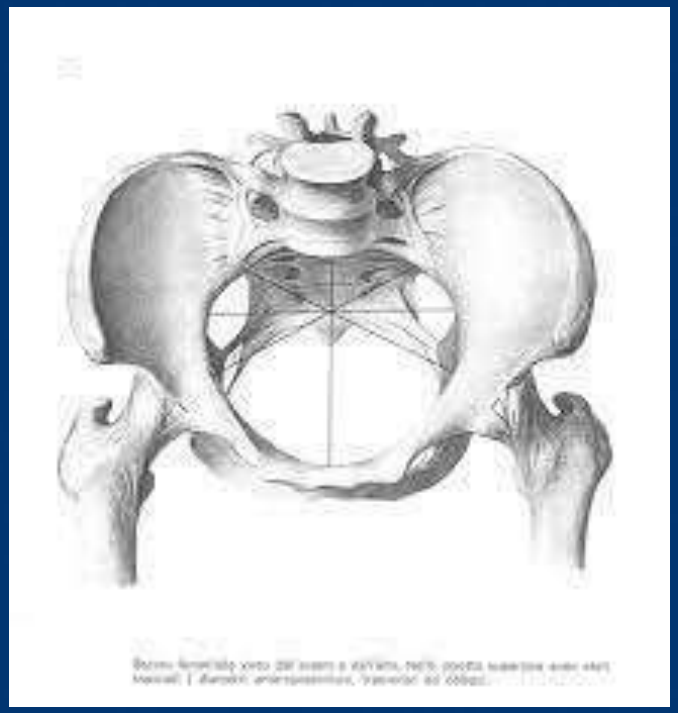
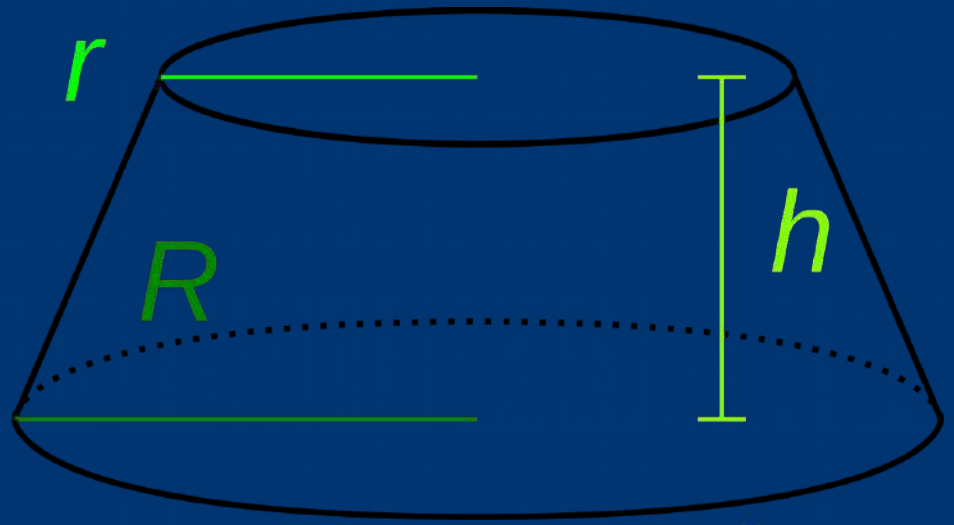
LET'S SPEAK ABOUT… GEOMETRY





$$V = \frac{1}{3}h\pi(r_1^2 + r_1 r_2 + r_2^2)$$

$$V = \frac{1}{3}h\pi(r_1^2 + r_1 r_2 + r_2^2)$$

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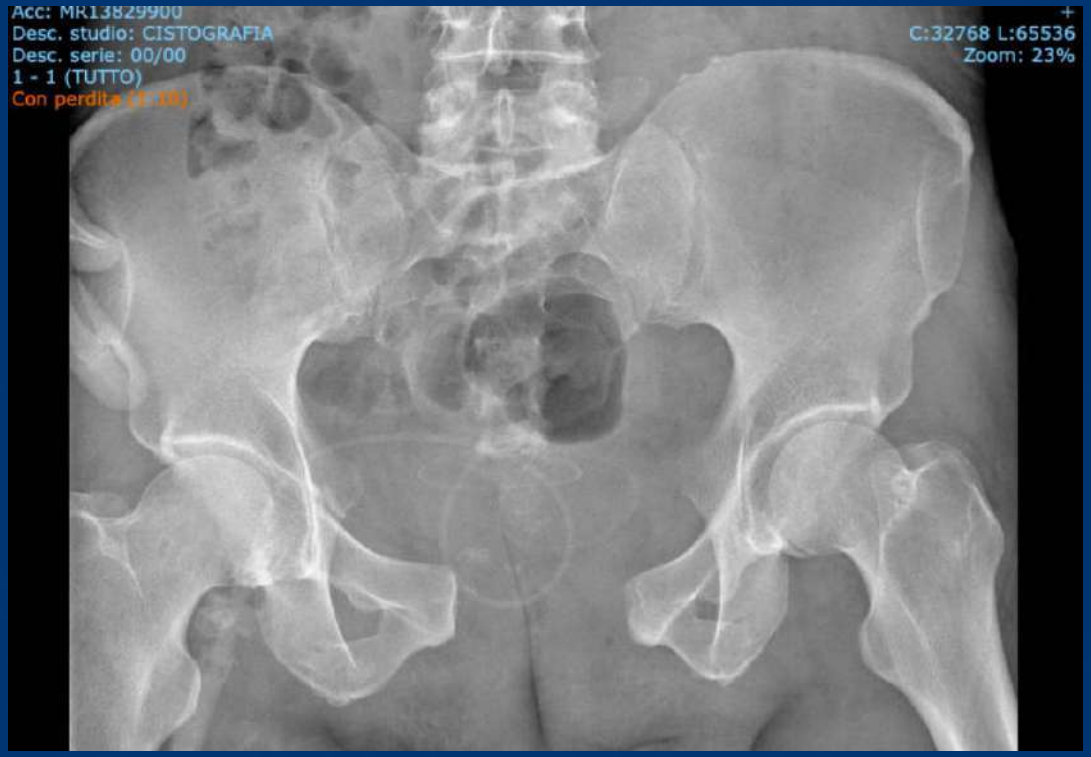
REVIEW Open Access

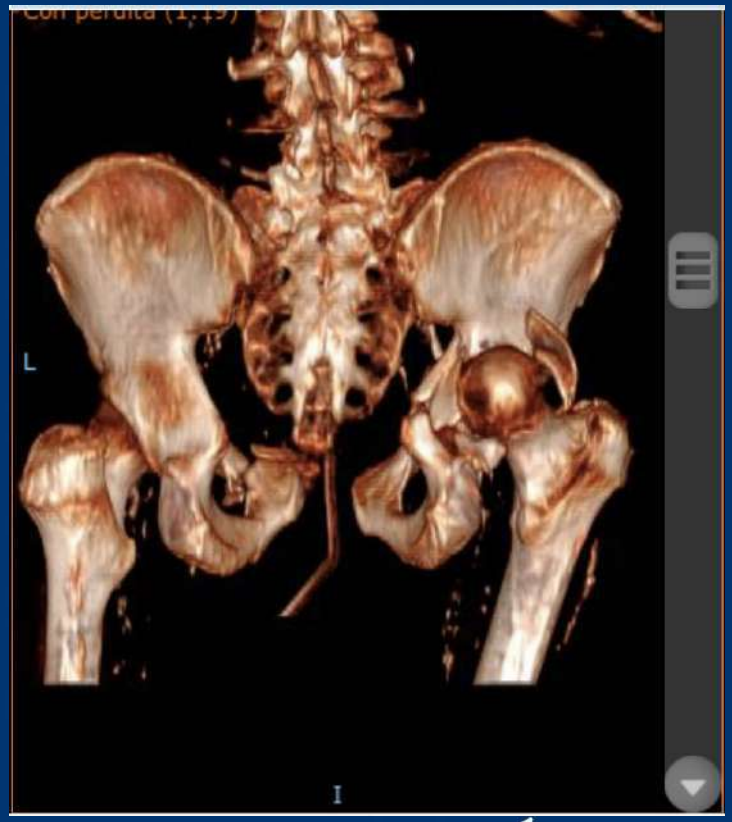
Pelvic trauma guidelines

Federico Coccolini[1*], Philip F.
Ernest E. Moore[7], Andrew B. P
Sandro Rizoli[12], Andrew Kirkpa
Leonardo Solaini[1], Marco Cere
Noel Naidoo[19], Dieter Weber[2

Background

Pelvic trauma (PT) is one of the most complex management in trauma care and occurs in 3% of skeletal injuries [1–4]. Patients with pelvic fractures are usually young and they have a high overall injury severity score (ISS) (25 to 48 ISS) [3]. Mortality rates remain high, particularly in patients with hemodynamic instability, due to the rapid exsanguination, the difficulty to achieve hemostasis and the associated injuries [1, 2, 4, 5]. For these reasons, a multidisciplinary approach is crucial to manage the resuscitation, to control the bleeding and to manage bones injuries particularly in the first hours from trauma. PT patients should have an integrated management between trauma surgeons, orthopedic surgeons, interventional radiologists, anesthesiologists, ICU doctors and urologists 24/7 [6, 7].





AND NOW?

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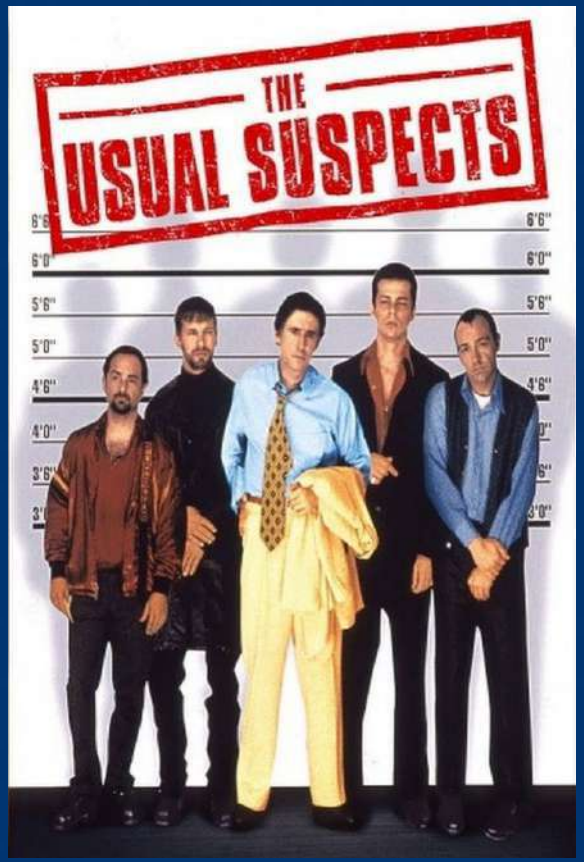
PRE-HOSPITAL



PRE-H US

PENETRATING INJURIES

ASYMMETRIES

SHOCK

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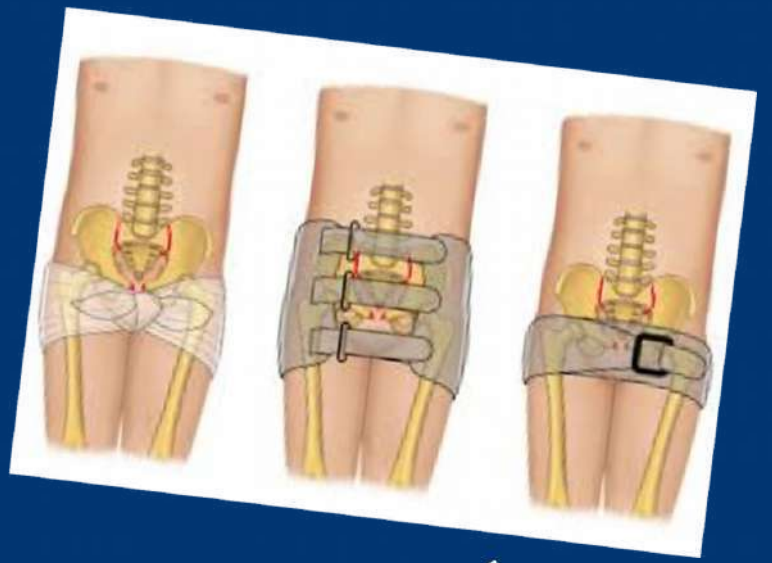
WHAT TOOLS?



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Effect of a new pelvic stabilizer (T-POD®) on reduction of pelvic volume and haemodynamic stability in unstable pelvic fractures

Edward C.T.H. Tan[a,*], Sander F.L. van Stigt[a], Arie B. van Vugt[b]

[a] Department of Surgery - Division of Trauma Surgery, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands
[b] Department of Surgery, Medisch Spectrum Twente, Enschede, The Netherlands

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Review

Effectiveness and complications of pelvic circumferential cor
patients with unstable pelvic fractures: A systematic review

Willem R. Spanjersberg, Simon P. Knops, Niels W.L. Schep, Esther M.M. van
Peter Patka, Inger B. Schipper [1]

Conclusions

The currently available literature on PCCDs in patients with suspected pelvic fractures indicates a reduction of blood loss, and does not show life threatening complications associated with the PCCD use. Despite the absence of level I and II evidence for the clinical effectiveness of PCCDs, publications so far (level III–V) report that PCCDs are effective in reducing fractures and associated hemorrhaging. The nature, severity, and rates of PCCD related complications are not fully known. The effectiveness and safety of PCCD use in individual fracture types, also remain to be determined. Cases published do suggest a certain risk of skin damage and possible damage to internal organs after the use of a PCCD. The authors therefore state that prospective randomised

made to measure the effect on reduction in symphyseal diastasis.

Results: Application of the T-POD® reduced the symphyseal diastasis with 60% ($p = 0.01$). The mean arterial pressure (MAP) increased significant from 65.3 to 81.2 mm Hg ($p = 0.03$) and the heart rate declined from 107 beats per minute to 94 ($p = 0.02$). Out of ten patients in whom the circulatory response before and after the T-POD® was recorded, seven were good responders, one had a transient response and two responded poor.

BE CAREFUL

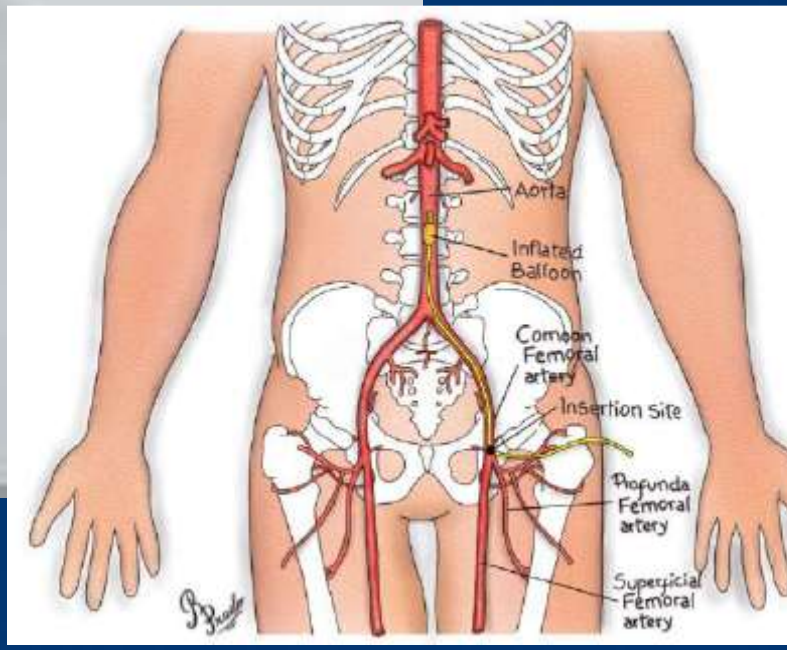
Conclusions

This paper supports previous research that a significant proportion of pelvic binders are sub-optimally placed. Given the application of pelvic binders is aimed at improving haemodynamic management of unstable pelvic injuries it is important to ensure correct fit for optimal efficacy and reduction of complications. Our findings of risk factors for sub-optimal position should be incorporated into education for clinicians applying the binders to highlight trauma patient populations in whom fit is challenging or be considered in the design of future pelvic binders. Equally, clinicians should be confident in their assessment of fit using plain pelvic radiography and ideal positioning for the binder allowing them to adjust the position as clinically required.

OR

TEMPORIZE IT..

REBOA


Aorta
Inflated Balloon
Common Femoral artery
Insertion Site
Profunda Femoral artery
Superficial Femoral artery

S 2018

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Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper

Resuscitative endovascular balloon occlusion of the aorta (REBOA) in the pre-hospital setting: An additional resuscitation option for uncontrolled catastrophic haemorrhage☆

Samy Sadek[a,*], David J. Lockey[b], Robbie A. Lendrum[c], Zane Perkins[d], Jonathan Price[e], Gareth Edward Davies[f]

[a] Emergency Medicine and Pre-Hospital Care, The Royal London Hospital, London's Air Ambulance, Essex and Herts Air Ambulance, The Institute of Pre-Hospital Care, Whitechapel, London E1 1BB, United Kingdom
[b] Anaesthetia and Pre-Hospital Care, Honorary Professor of Trauma and Pre-hospital Emergency Medicine, Bristol, Honorary Senior Research Fellow, QMUL, London's Air Ambulance, Blizzard Institute, Queen Mary University of London, United Kingdom
[c] Cardiothoracic and Trauma Anaesthetist, Edinburgh Royal Infirmary, NHS Lothian, London's Air Ambulance, Department of Anaethesia and Critical Care, Royal Infirmary of Edinburgh, 51 Little France Crescent, EH16 4SA, United Kingdom
[d] Centre for Trauma Sciences, Queen Mary University, London, United Kingdom
[e] Hepatobiliary and Liver Transplant Anaesthesia, The Royal Free Hospital, London's Air Ambulance, United Kingdom
[f] Pre-Hospital Care and Emergency Medicine, London's Air Ambulance, Honorary Senior Lecturer, Trauma Sciences, QMUL, Helipad, The Royal London Hospital, Whitechapel, London E1 1BB, United Kingdom

RESUSCITATION 135 (2019) 6–13

Available online at www.sciencedirect.com

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper

Pre-hospital Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) for exsanguinating pelvic haemorrhage

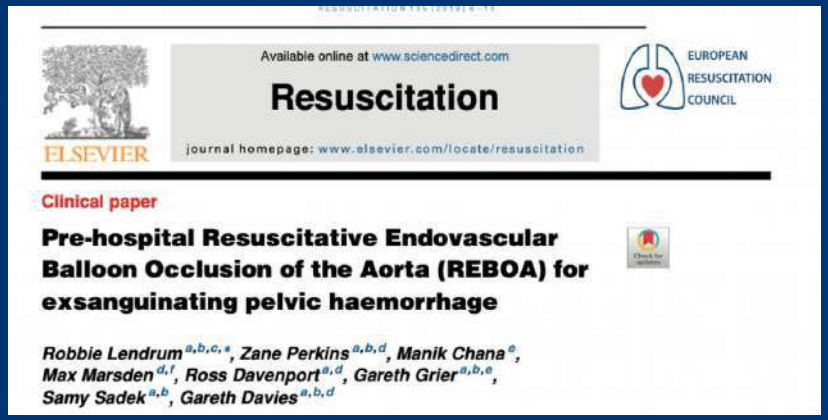
Robbie Lendrum[a,b,c,*], *Zane Perkins*[a,b,d], *Manik Chana*[e], *Max Marsden*[d,f], *Ross Davenport*[a,d], *Gareth Grier*[a,b,e], *Samy Sadek*[a,b], *Gareth Davies*[a,b,d]

PRE-H REBOA

Pre-hospital REBOA

Indications for pre-hospital Zone III REBOA are adults with non-compressible exsanguinating haemorrhage from either blunt or penetrating pelvic injury. REBOA is performed as an adjunct to standard trauma care in patients assessed to be at risk of imminent hypovolaemic cardiac arrest secondary to exsanguinating pelvic haemorrhage (with or without lower limb haemorrhage). This group

THE HATEFUL EIGHT



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Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

EUROPEAN RESUSCITATION COUNCIL

Clinical paper

Pre-hospital Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) for exsanguinating pelvic haemorrhage

Robbie Lendrum[a,b,c,], Zane Perkins[a,b,d], Manik Chana[e], Max Marsden[d,f], Ross Davenport[a,d], Gareth Grier[a,b,e], Samy Sadek[a,b], Gareth Davies[a,b,d]*

TACHY-BRADYCARDIA

ALTERED MENTATION

LOW-FALLING ETCO2

AIR-HUNGER

VENOUS COLLAPSE

CLAMMY

PALE

HYPOTENSION

Table 3 – In-hospital management of injured patients who underwent pre-hospital Zone III REBOA.

Patient	CT prior to DHCP	Immediate Interventional Radiology	Immediate Open Surgery	Location of definitive balloon deflation	Haemorrhage control Intervention	Other surgical procedures
1	Y	Y	N	IR	IIA embolisation	Femoral fixation, endovascular thoracic aortic dissection repair
2	Y	N	Y	OR	Laparotomy, pelvic packing, IIA embolisation.	Ileostomy, colostomy, fasciotomies, popliteal artery interposition graft, TKA, pelvic fixation
3	N	N	Y	NA	Laparotomy, pelvic packing	Thoracotomy
4	N	N	Y	OR	Laparotomy, pelvic packing	Pelvic and tibial fixation
5	Y	Y	N	IR	REBOA	Pelvic fixation & femoral fixation
6	Y	N	N	CT	REBOA	Pelvic and femoral fixation, completion TKA
7	Y	N	N	CT	REBOA	Craniectomy
8	N	N	Y	NA	REBOA	Laparotomy, resuscitative thoracotomy
9	N	N	Y	OR	Laparotomy, pelvic packing, IIA embolisation	Repair SFA REBOA puncture site, Supra pubic catheter
10	N	N	Y	OR	Laparotomy, pelvic packing, splenectomy, bilateral IIA ligation, Repair CFA	Pelvic fixation, Bilateral BKAs
11	Y	N	N	CT	REBOA	Bilateral Femoral fixation, fixation radius
12	Y	N	Y	OR	Laparotomy, ligation IIA	Pelvic and ankle fixation, resection of rectum.
13	N	N	Y	OR	REBOA	AKA, popliteal artery interposition graft, X-Fix

CT, computed tomography; DHCP, definitive haemorrhage control procedure; IR, interventional radiology; IIA, internal iliac artery; OR, operating room; TKA, through knee amputation; NA, not achieved; CFA, common femoral artery; SFA, superficial femoral artery; BKA, below knee amputation; AKA, above knee amputation.

Conclusion

This case series demonstrates the feasibility of REBOA in a physician led pre-hospital care system, as a resuscitation strategy for patients in extremis from exsanguinating pelvic haemorrhage. Pre-hospital Zone III REBOA significantly improves blood pressure and may reduce the risk of pre-hospital hypovolaemic cardiac arrest and early death due to exsanguination. Distal arterial thrombus formation is common, and should be expected and actively managed.

The introduction of this technique was supported by a structured education programme,[23] regular team training and a robust governance system. In addition, the Pre-hospital and Emergency Department Endovascular Resuscitation (PEER) Course was created to disseminate knowledge and learning regarding this resuscitation strategy within the wider pre-hospital and in-hospital team.

PRE-H TRANSFUSIONS

ORIGINAL CONTRIBUTIONS

PREHOSPITAL TRANSFUSION OF PLASMA AND RED BLOOD CELLS IN TRAUMA PATIENTS

John B. Holcomb, MD, Daryn P. Donathan, BS, Bryan A. Cotton, MD, Deborah J. del Junco, PhD, Georgian Brown, RN, Toni von Wenckstern, RN, Jeanette M. Podbielski, RN, Elizabeth A. Camp, PhD, Rhonda Hobbs, Yu Bai, MD, PhD, Michelle Brito, BS, Elizabeth Hartwell, MD, James Rod Duke, MD, Charles E. Wade, PhD

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Effect of pre-hospital red blood cell transfusion on mortality and time of death in civilian trauma patients

Marius Rehn[1,2,3,*], Anne Weaver[1,4], Karim Brohi[4,5], Sarah Eshelby[1], Laura Green[4,5,6], Jo Røislien[2,3] and David J Lockey[1,3,4,5]

Is prehospital blood transfusion effective and safe in haemorrhagic trauma patients? A systematic review and meta-analysis

Tim W.H. Rijnhout[a,*], Kimberley E. Wever[b], Roy H.A.R. Marinus[c], Nico Hoogerwerf[d], Leo M.G Geeraedts Jr.[e], Edward C.T.H. Tan[f]

BOLOGNA HEMS 2020

Resuscitation with blood products in patients with trauma-related haemorrhagic shock receiving prehospital care (RePHILL): a multicentre, open-label, randomised, controlled, phase 3 trial

Nicholas Crombie, Heidi A Doughty, Jonathan R B Bishop, Amisha Desai, Emily F Dixon, James M Hancox, Mike J Herbert, Caroline Leech, Simon J Lewis, Mark R Nash, David N Naumann, Gemma Slinn, Hazel Smith, Iain M Smith, Rebekah K Wale, Alastair Wilson, Natalie Ives, Gavin D Perkins, on behalf of the RePHILL collaborative group*

Summary

GROSSETO HEMS 2020

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IN-HOSPITAL APPROACH

Coccolini *et al. World Journal of Emergency Surgery* (2017) 12:5
DOI 10.1186/s13017-017-0117-6

World Journal of Emergency Surgery

REVIEW Open Access

Pelvic trauma: WSES classification and guidelines

Federico Coccolini[1*], Philip F. Stahel[2], Giulia Montori[1], Walter Biffl[3], Tal M Horer[4], Fausto Catena[5], Yoram Kluger[6], Ernest E. Moore[7], Andrew B. Peitzman[8], Rao Ivatury[9], Raul Coimbra[10], Gustavo Pereira Fraga[11], Bruno Pereira[11], Sandro Rizoli[12], Andrew Kirkpatrick[13], Ari Leppaniemi[14], Roberto Manfredi[1], Stefano Magnone[1], Osvaldo Chiara[15], Leonardo Solaini[1], Marco Ceresoli[1], Niccolò Allievi[1], Catherine Arvieux[16], George Velmahos[17], Zsolt Balogh[18], Noel Naidoo[19], Dieter Weber[20], Fikri Abu-Zidan[21], Massimo Sartelli[22] and Luca Ansaloni[1]

Hemodynamically STABLE?

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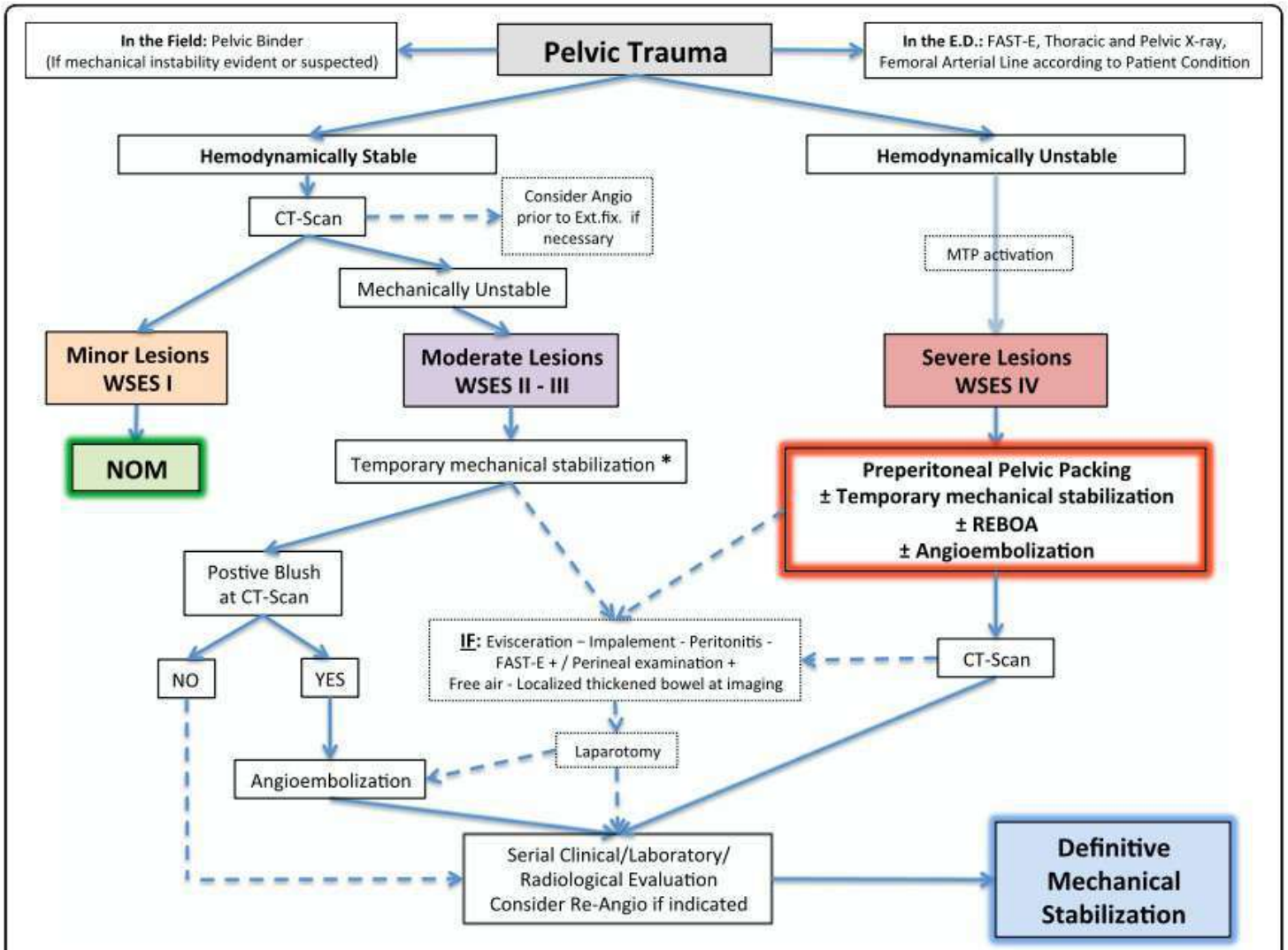

Fig. 3 Pelvic Trauma management algorithm (*: patients hemodynamically stable and mechanically unstable with no other lesions requiring

World Journal of Emergency Surgery

REVIEW Open Access

Pelvic trauma: WSES classification and guidelines

Federico Coccolini[1*], Philip F. Stahel[2], Giulia Montori[3], Walter Biffl[4], Tal M Horer[5], Fausto Catena[3], Yoram Kluger[6], Ernest E. Moore[7], Andrew B. Peitzman[8], Rao Ivatury[9], Raul Coimbra[10], Gustavo Pereira Fraga[11], Bruno Pereira[11], Sandro Rizoli[12], Andrew Kirkpatrick[13], Ari Leppaniemi[14], Roberto Manfredi[1], Stefano Magnone[1], Osvaldo Chiara[15], Leonardo Solaini[1], Marco Ceresoli[1], Niccolò Alfieri[1], Catherine Arvieux[16], George Velmahos[17], Zsolt Balogh[18], Noel Naidoo[19], Dieter Weber[20], Fikri Abu-Zidan[21], Massimo Sartelli[22] and Luca Ansaloni[1]

PELVIC INJURIES

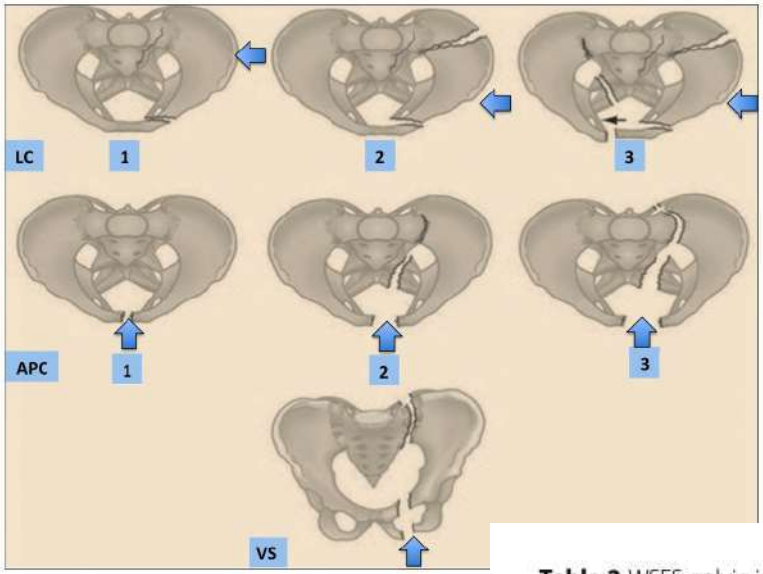

Fig. 2 Young and Burgees classification for skeletal pelvic lesions

Table 2 WSES pelvic injuries classification (*: patients hemodynamically stable and mechanically unstable with no other lesions requiring treatment and with a negative CT-scan, can proceed directly to definitive mechanical stabilization. LC: Lateral Compression, APC: Antero-posterior Compression, VS: Vertical Shear, CM: Combined Mechanism, NOM: Non-Operative Management, OM: Operative Management, REBOA: Resuscitative Endo-Aortic Balloon)

	WSES grade	Young-Burgees classification	Haemodynamic	Mechanic	CT-scan	First-line Treatment
MINOR	WSES grade I	APC I – LC I	Stable	Stable	Yes	NOM
MODERATE	WSES grade II	LC II/III - APC II/III	Stable	Unstable	Yes	Pelvic Binder in the field ± Angioembolization (if blush at CT-scan) OM – Anterior External Fixation *
	WSES grade III	VS - CM	Stable	Unstable	Yes	Pelvic Binder in the field ± Angioembolization (if blush at CT-scan) OM - C-Clamp *
SEVERE	WSES grade IV	Any	Unstable	Any	No	Pelvic Binder in the field Preperitoneal Pelvic Packing ± Mechanical fixation (see over) ± REBOA ± Angioembolization

WHICH ARROWS?

Severe Lesions
WSES IV

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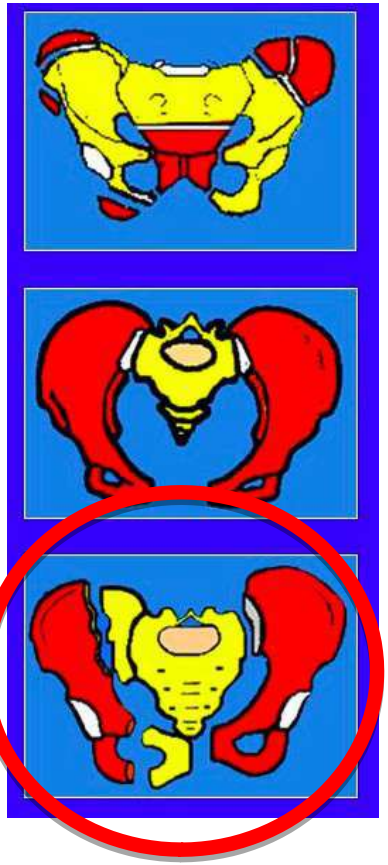
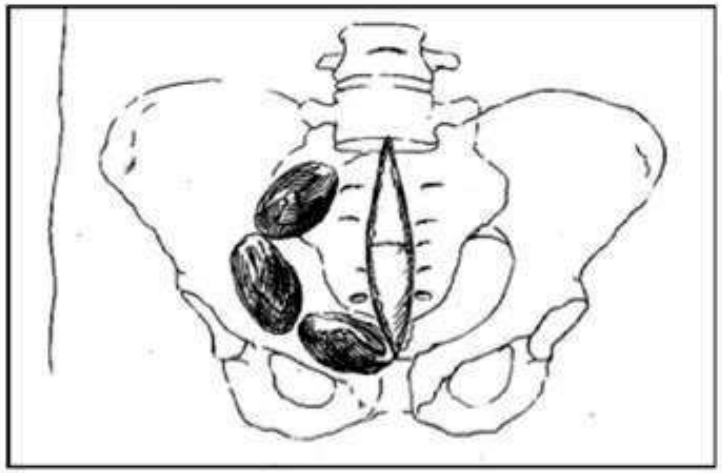
Conclusion

In summary, there is no evidence for an advantage of the pelvic C-clamp over the pelvic binder, regarding bleeding control in type-C pelvic ring injuries. On the contrary, using the pelvic binder, by trend, shows better results than using the C-clamp. Moreover, the pelvic binder is easier and, especially, much quicker to use and apply. Therefore, to achieve immediate bleeding control in unstable pelvic ring injuries, rather the pelvic binder than the C-clamp should be used.

However, especially in the case of unstable type-C pelvic ring injuries, in which a timely definitive stabilization of the posterior pelvic ring is not possible due to other injuries (e.g. severe head injuries), the C-clamp might play an important role in the treatment concept, together with an external fixator stabilization of the pelvic ring. Thus, known complications related to the long-term use of a pelvic binder, like pressure marks or dislocation of the device, can be avoided, and ICU-care can be easily facilitated, for example because of a better accessible anogenital region. Primary use of the C-clamp should remain a treatment for selected cases only and if the trauma surgeon is familiar with it.

Received: 29 August 2020; Accepted: 30 December 2020
Published online: 27 January 2021





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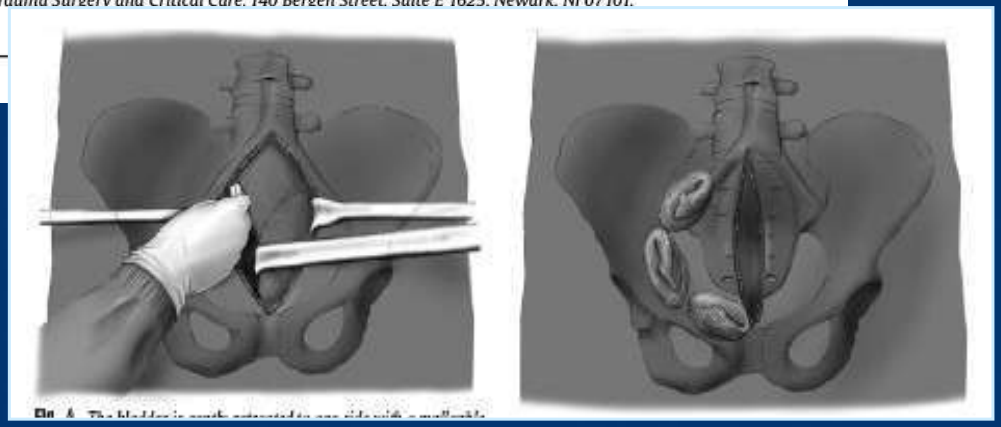
Review

Prepe

Dina M. [illegible], Adam B. Fox

[a] *Rutgers University NJMS, Department of General Surgery, Residency Office, 185 South Orange Avenue, MSB G-512, Newark, NJ 07103, USA*
[b] *Rutgers University NJMS, Department of General Surgery, Division of Trauma Surgery and Critical Care, 140 Bergen Street, Suite E 1625, Newark, NJ 07101, USA*



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Preperiton
life-threat

with
ures

Clay Cothr
Amy E. W

Despite this reduction in mortality, PPP should not be adopted for use in all pelvic fracture patients; this invasive procedure should be reserved for the patient in refractory shock despite hemostatic resuscitation. We feel this "trigger" for intervention for pelvic fracture–related bleeding, hypotension despite two units of RBCs, is a reasonable one. Would these patients have stopped bleeding if we had simply continued to transfuse them? That is hard to say. The mean transfusion was four units of RBCs in the ED, and the patients remained hypotensive. The "trigger" for angiography at other institutions includes a pelvic hematoma, a blush on CT scan in a stable patient, a SBP < 90 mm Hg regardless of transfusion requirements, or for the first unit of RBCs transfused.[18] A similar statement could be made of patients undergoing AE; perhaps they did not need the intervention and simply would have stopped bleeding. In the end, we feel we need a "trigger" to intervene for pelvic fracture–related bleeding and believe ours is a reasonable one. In our experience, only 6% of all

in the patient who remains hemodynamically unstable despite initial blood transfusion.

MORE THAN 80% OF BLEEDING ARE VENOUS..

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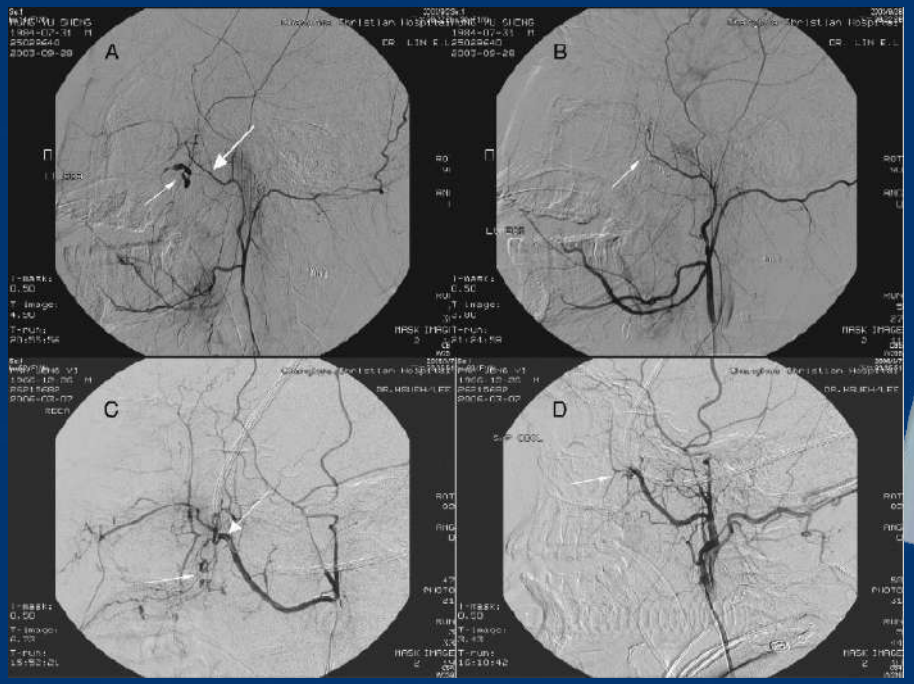
ARTERIAL B[illegible]EDING?



The use of REBOA should take into account skills, high expertise on their applicability [47, 48], acceptability of clinicians and cost [49, 50]. For optimal success, REBOA requires careful system-wide multidisciplinary implementation [51]. Institutions are responsible for analysing qualifications for providers to perform REBOA [42] as well as evaluating system capabilities [52]. A very small number of trauma centres have an extensive experience with REBOA; thus, these results may not be generalizable to all trauma centres [42]. Finally, we included studies with a heterogeneous use of REBOA which should be taken into account (catheter size, occlusion zone, protocols, physiologic indications for REBOA insertion).

Conclusion

Among non-compressible torso injuries, we found a positive effect on overall mortality of REBOA when compared to RT but no valid conclusions can be made due to selection bias, while not statistically significant the comparison of REBOA versus no-REBOA from which the most valuable contribution for clinical practice is drawn. REBOA should be promoted in specific training programs in an experimental setting in order to test its effectiveness as temporary management to haemorrhage control and resuscitation. Prospectively assessed data with specific inclusion and exclusion criteria ideally in a randomized controlled trial, should be planned in order to limit the bias coming from observational studies. Future studies must address specific indications for REBOA to know which population could benefit the most from its use.

Abbreviations

aOR: Adjusted odds ratio; GCS: Glasgow Coma Scale; IQR: Interquartile range; ISS: Injury severity score; MD: Mean difference; MOOSE: Meta-Analysis of Observational Studies in Epidemiology; OR: Odds ratio; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; RCT: Randomized controlled trials; REBOA: Resuscitative Endovascular Balloon Occlusion of the Aorta; RoB: Cochrane Risk of Bias; RT: Resuscitative thoracotomy; SMD: Standardized mean difference; SNLG: Sistema Nazionale Linee Guida

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13017-021-00386-9.

Additional file 1.

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Italian National Institute of Health guideline working group on Major Trauma: Nino Stocchetti, Elvio De Blasio, Gaddo Flego, Massimo Geraci, Giulio Maccauro, Antonio Rampoldi, Federico Santolini, Claudio Tacconi, Gregorio Tugnoli. We would like to thank Maurella Della Seta, Scilla Pizzarelli, Rosaria Rosanna Cammarano, the Istituto Superiore di Sanità documentalists for performing the search strategy, and Alessia Medici and Alessandro Mazzola for the administrative and organizational support

Lista delle raccomandazioni formulate

Quesito 7: Il posizionamento del REBOA (Resuscitative Endovascular Balloon Occlusion of the Aorta) è efficace dal punto di vista clinico e dei costi per il controllo temporaneo dell'emorragia grave nei pazienti con Trauma Maggiore?

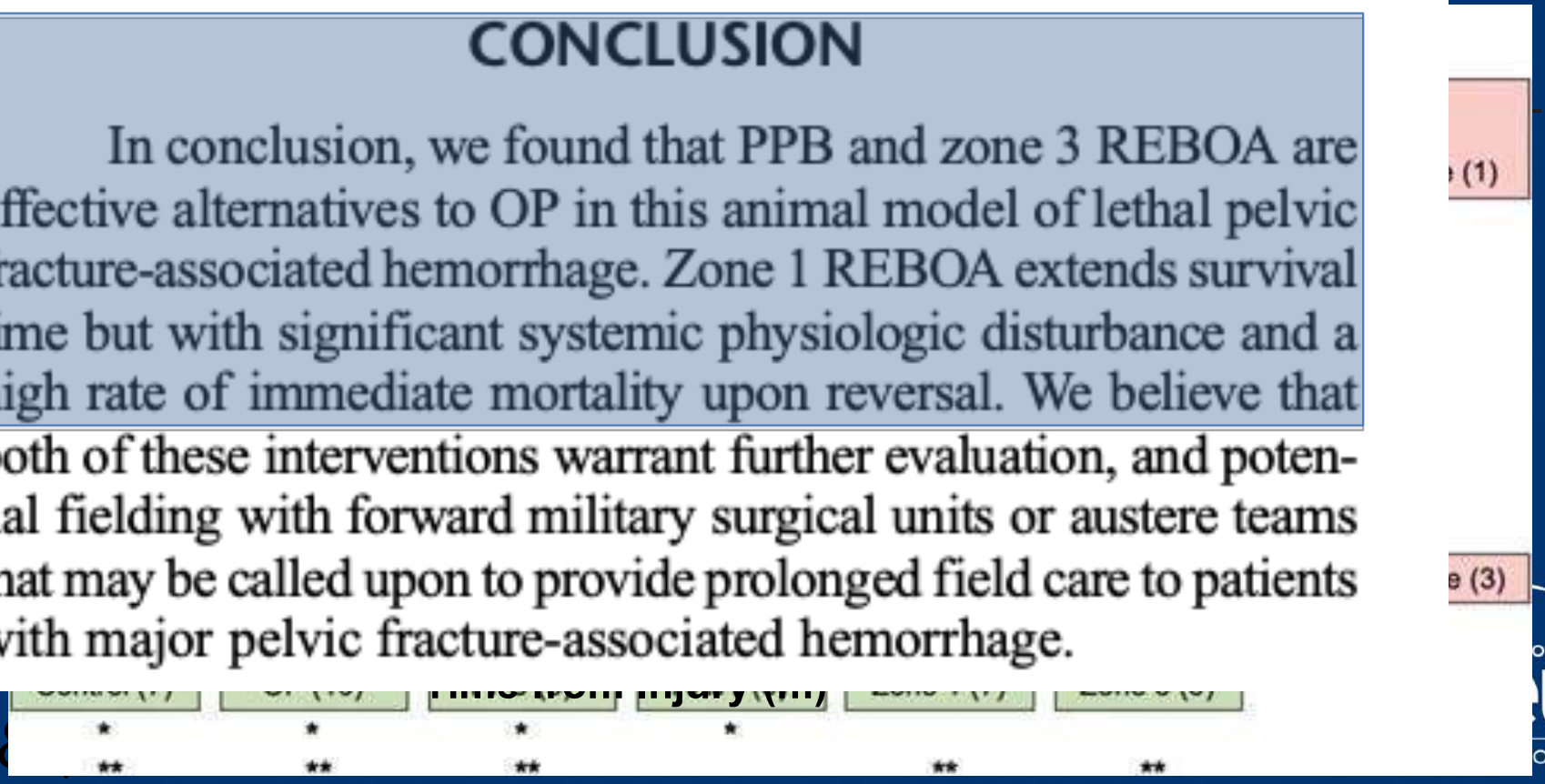
Raccomandazione 12. Nel paziente con Trauma Maggiore e con ipotensione da shock emorragico non vi è indicazione all'utilizzo del REBOA se non nell'ambito di adeguati programmi di sperimentazione [raccomandazione forte, qualità delle prove molto bassa].

Raccomandazione 13. In pazienti in arresto/peri-arresto cardiocircolatorio da cause emorragiche, presumibilmente sottodiaframmatiche, è preferibile l'utilizzo del REBOA alla toracotomia resuscitativa come misura temporanea in attesa del controllo definitivo dell'emorragia [raccomandazione condizionata, qualità delle prove molto bassa].

REBOA vs PELVIC PACKING

CONCLUSION

In conclusion, we found that PPB and zone 3 REBOA are effective alternatives to OP in this animal model of lethal pelvic fracture-associated hemorrhage. Zone 1 REBOA extends survival time but with significant systemic physiologic disturbance and a high rate of immediate mortality upon reversal. We believe that both of these interventions warrant further evaluation, and potential fielding with forward military surgical units or austere teams that may be called upon to provide prolonged field care to patients with major pelvic fracture-associated hemorrhage.



J Trau
Volume 8

Role of REBOA in hemodynamic unstable pelvic ring injuries

- *- Resuscitative thoracotomy with aortic cross-clamping represents an acute measure of temporary bleeding control for unresponsive patients "in extremis" with exsanguinating traumatic hemorrhage. [Grade 1A]*
- *- REBOA technique may provide a valid innovative alternative to aortic cross-clamping [Grade 2B].*
- *- In hemodynamic unstable patients with suspected pelvic bleeding (systolic blood pressure <90 mmHg or non-responders to direct blood products transfusion), REBOA in zone III should be considered as a bridge to definitive treatment [Grade 2B].*
- *- In major trauma patients with suspected pelvic trauma, arterial vascular access via femoral artery (e.g. 5Fr) introducer might be considered as the first step for eventually REBOA placement [Grade 2C].*
- *- Partial-REBOA or/and intermittent-REBOA should be considered to decrease occlusion time and ischemic insult [Grade 2C].*

Role of Pre-peritoneal Pelvic Packing in hemodynamically unstable pelvic fractures

- *- Patients with pelvic fracture-related hemodynamic instability should always be considered for pre-peritoneal pelvic packing, especially in hospitals with no angiography service [Grade 1C].*
- *- Direct preperitoneal pelvic packing represents an effective surgical measure of early haemorrhage control in hypotensive patients with bleeding pelvic ring disruptions [Grade 1B].*
- *- Pelvic packing should be performed in conjunction with pelvic stabilization to maximize the effectiveness of bleeding control [Grade 2A].*
- *- Patients with pelvic fracture-related hemodynamic instability with persistent bleeding after angiography should always be considered for pre-peritoneal pelvic packing [Grade 2A].*
- *- Pre-peritoneal pelvic packing is an effective technique in controlling hemorrhage in patients with pelvic fracture-related hemodynamic instability undergone prior anterior/C-clamp fixation [Grade 2A].*

- Skill Chirurgica “easy”
- Target selettivo: emorragia pelvica
- Ottimo tamponamento/controllo emorragia a bassa pressione (venoso/osseo)
- Complicanze locali
- Poche complicanze sistemiche

PELVIC Packing

REBOA

- Skill multidisciplinare
- Effetto Bridge limitato nel tempo
- rischio di complicanze sistemiche (ischemia/riperfusione/sindrome compartimentale)
- Effetto modulabile (reboa parziale, intermittente)
- Target multiplo: addome, pelvi, arti
- Utilizzabile in paz in ACR

CONCLUSION

While mortality analyses are a key outcome in trauma research, in this instance, it is unwise to directly compare the mortality rates of PPP and AE, 22% and 36%. It is impossible to directly compare these modalities because of the bias, heterogeneity, and inadequate reporting of physiological data. Decision making for the role of AE and PPP needs to be decided by the treating team based on the physiological status of the patient, and the current literature cannot inform that decision-making process. Based on the literature, more than one quarter of patients who proceed to PPP in the initial instance required subsequent AE for hemorrhage control. This systematic review highlights the need for standardized reporting in this high-risk group of trauma patients.

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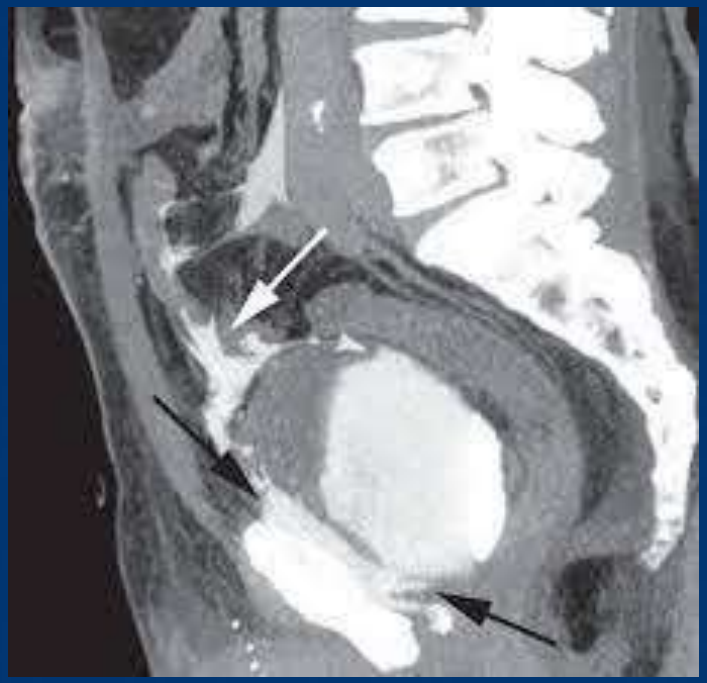
DONT'FORGET....



Genitourinary injury

Vascular injury

TAKE HOME MESSAGE

Background

Pelvic trauma (PT) is one of the most complex management in trauma care and occurs in 3% of skeletal injuries [1–4]. Patients with pelvic fractures are usually young and they have a high overall injury severity score (ISS) (25 to 48 ISS) [3]. Mortality rates remain high, particularly in patients with hemodynamic instability, due to the rapid exsanguination, the difficulty to achieve hemostasis and the associated injuries [1, 2, 4, 5]. For these reasons, a multidisciplinary approach is crucial to manage the resuscitation, to control the bleeding and to manage bones injuries particularly in the first hours from trauma. PT patients should have an integrated management between trauma surgeons, orthopedic surgeons, interventional radiologists, anesthesiologists, ICU doctors and urologists 24/7 [6, 7].

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