



DCO - Five Tricks for Pelvic Fractures

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DCO for Pelvic Fractures

- Pelvic ex fix
- C-clamp
- Pelvic packing
- IS screws
- In-fix





Many thanks to Drs. John Floyd, Wade Smith, Bruce Ziran and Will Reisman!



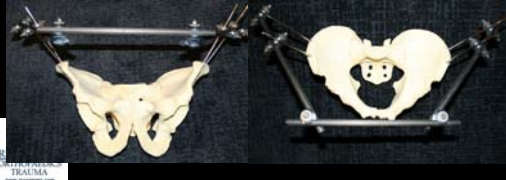
Construction – pelvic frames

- Indications:
 - “Open-book” pelvic injuries in hypovolemic shock not responsive to other measures.
 - Grossly unstable fractures.
- Methods:
 - Iliac crest pins.
 - AIIIS pins.



Construction – pelvic frames

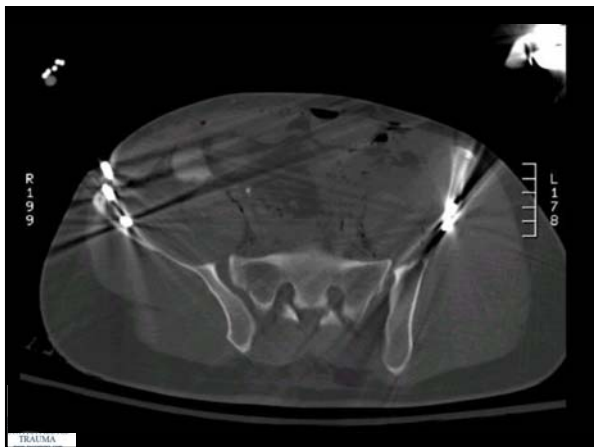
- Iliac crest frames:
 - Three 5 mm pins/side.
 - Place on medial 1/3 of iliac crest.
 - Assemble anterior bars to allow access to the abdomen and sitting*.



Construction – pelvic frames

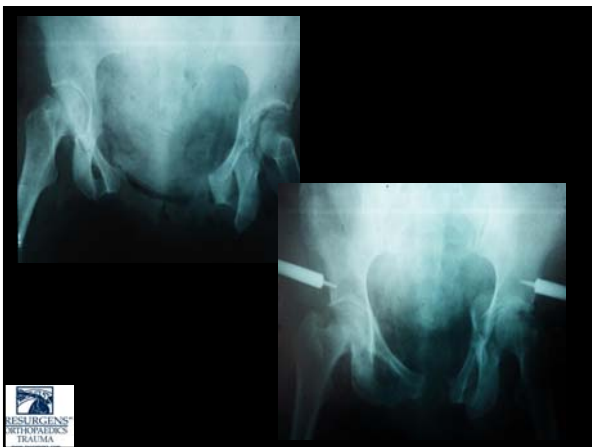
- AIIS Frame:
 - 6 mm pin anterior to posterior.
 - Placed in AIIS on the obturator oblique view.





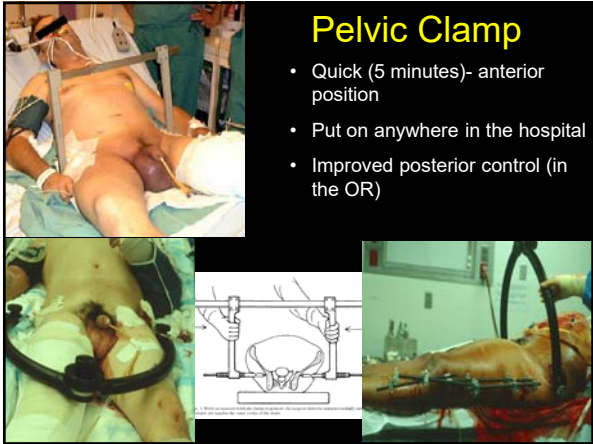


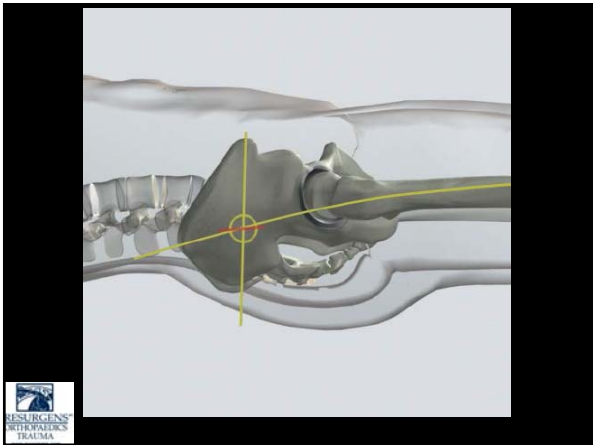


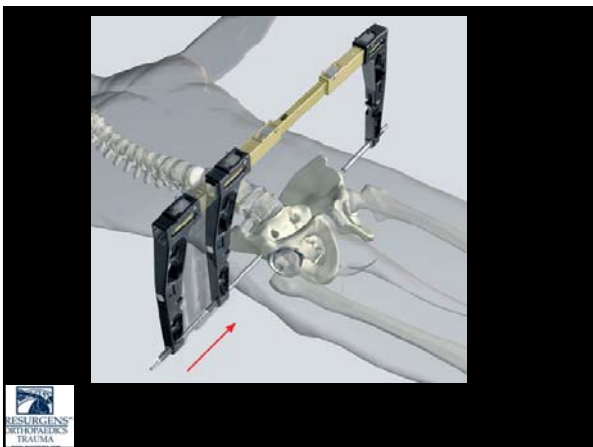


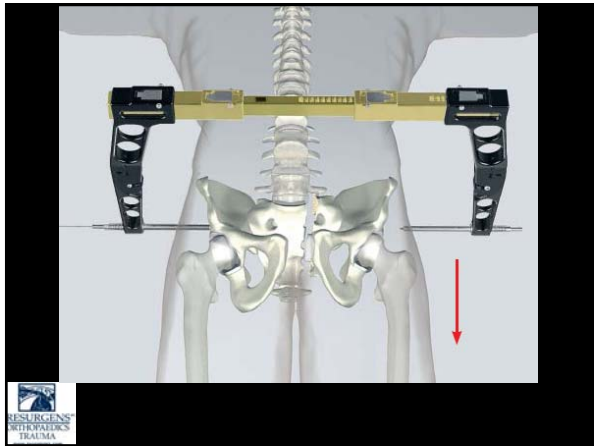
Pelvic Clamp

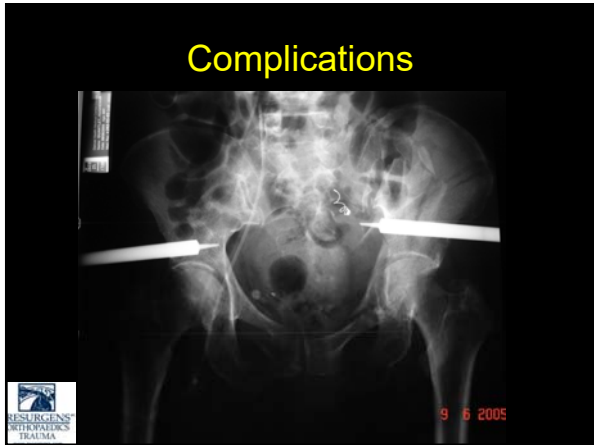
- Quick (5 minutes)- anterior position
- Put on anywhere in the hospital
- Improved posterior control (in the OR)

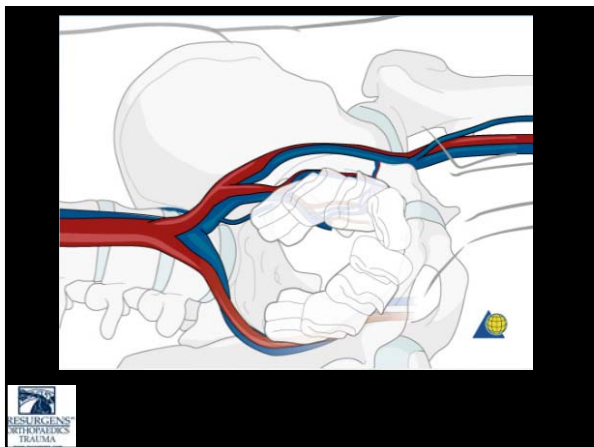












Denver Health Experience- modified retroperitoneal approach

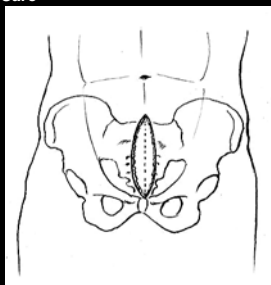
- Shock after 2u RBC
- **Retroperitoneal packing**
- C clamp, Exfix or plate in some cases
- Angio if continued shock or arterial bleeding seen in OR
- Takes 30 minutes maximum
- Journal of Trauma, Dec 2005
- Journal of Trauma, Jan 2007



Pelvic Packing : Suprapubic Incision

Retroperitoneal Packing as a Resuscitation Technique for Hemodynamically Unstable Patients with Pelvic Fractures: Report of Two Representative Cases and a Description of Technique

Wade R. Smith, Ernest E. Moore, Patrick Osborn, Juan F. Agudelo, Steven J. Morgan, Anand A. Parekh, Clay Cothren, *The Journal of TRAUMA_ Injury, Infection, and Critical Care*

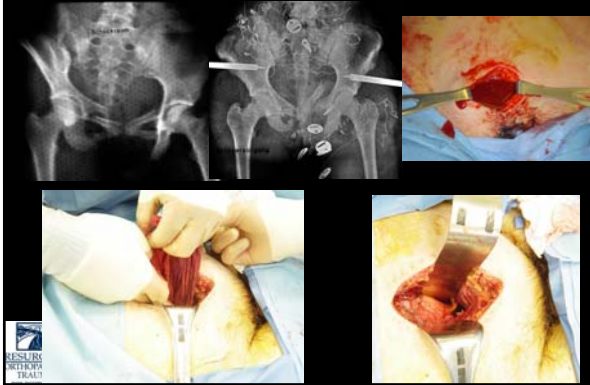


J Trauma 2005

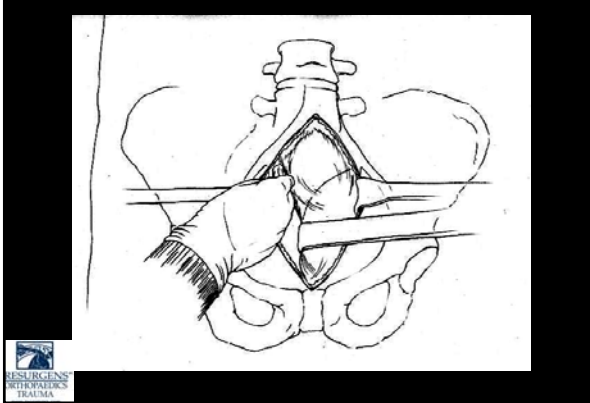
Emergent Pelvic Packing : LC III Pelvic Fracture



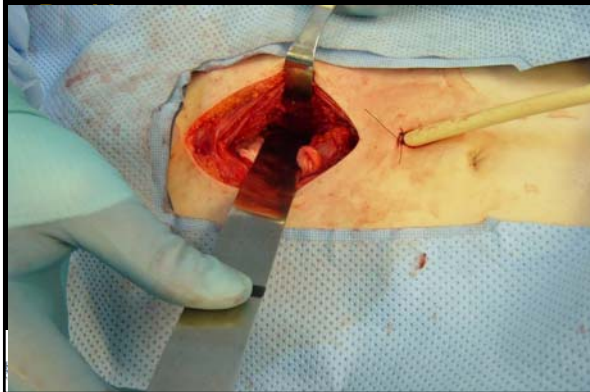
May Lower Mortality



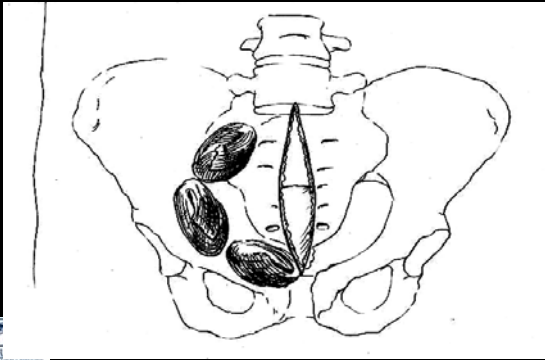
Pelvic Packing : Retract Bladder



Emergent Retroperitoneal Pelvic

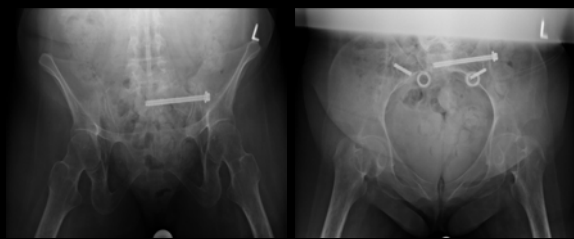


Pelvic Packing : Lap Pads X 3 / Side



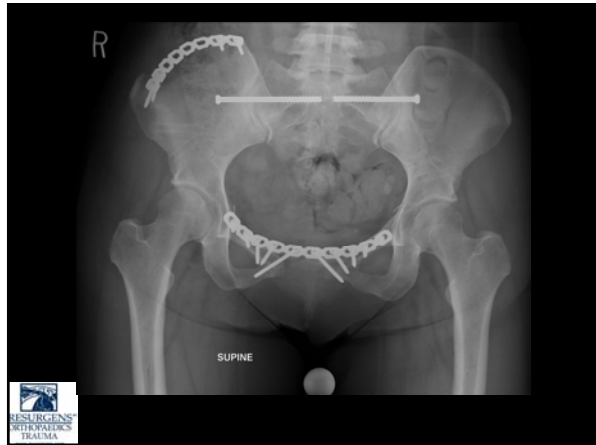


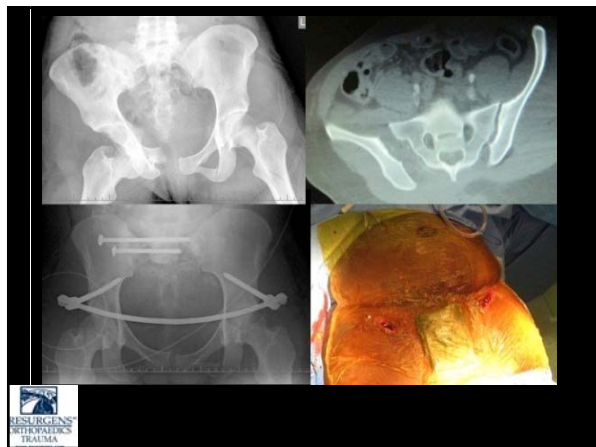
Iliosacral fixation



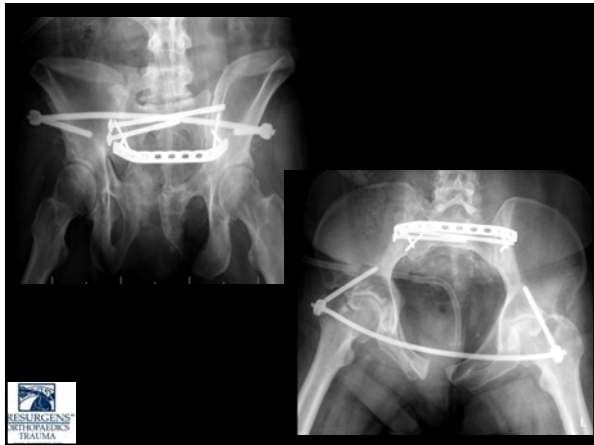
Transsacral fixation

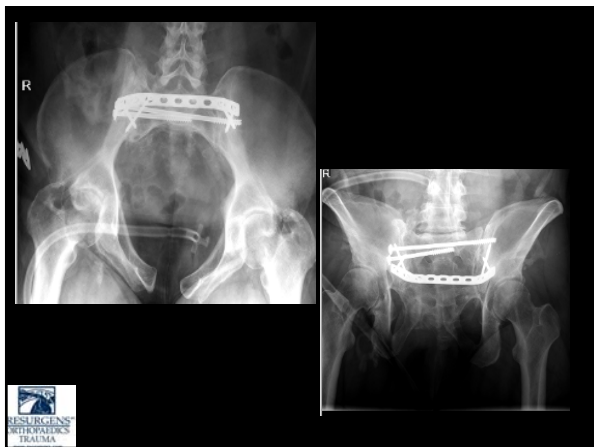












DCO - Five Tricks for Pelvic Fractures

- Pelvic ex fix – learn anterior pins
- C-clamp – if extremis
- Pelvic packing – your trauma person should know
- IS screws – think about it!
- In-fix – under certain circumstances!





DCO - Five Tricks for Soft Tissue Injuries

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Five tricks

- Minimize further injury
- Silvadene
- Reasonable sharp debridement
- NWPT
- Lateral fasciotomies



Minimize further injury

- Reduce deformity
- Splint
- Early irrigation and removal of debris
- Sterile dressings
- Increase oxygenation
- Early antibiotics
- Local antibiotics
- Epifix



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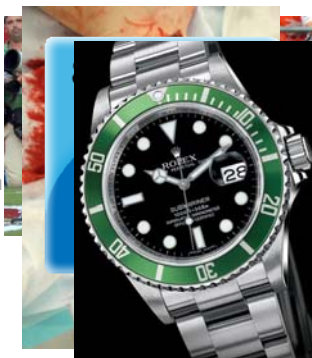
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Resuscitation

- Significant relationship between:
 - Incidence of infection
 - Time from injury to admission to the definitive treatment center.
- Reason is unclear.
 - Pollak AN: Timing of Debridement of Open Fractures *J Am Acad Orthop Surg* September 2006 vol. 14 no10 S48-S51.



Silvadene

- "All blisters were unroofed, and antibiotic cream (Silvadene) was applied twice daily until the blister bed had re-epithelialized.
- "We urge caution when planning to make a surgical incision around ... fracture blisters in diabetic patients because the zone of injury might extend beyond the borders of the fracture blister."
 - Strauss EJ, Petrucci G, Bong M, Koval KJ, Egol JA: Blisters associated with lower-extremity fracture: results of a prospective treatment protocol. *J Orthop Trauma*. 2006 Oct;20(9):618-622.



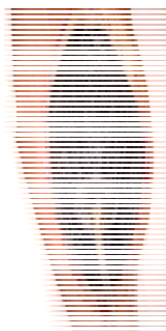
Reasonable sharp debridement

- Experience...
- Debride everything that needs to go...
- Don't get crazy though...
- Come back if you have any doubt at all!



Negative Pressure Therapy

- Greatly decreased open fracture complications.
 - Powell ET: The Role of Negative Pressure Wound Therapy with Reticulated Open Cell Foam in the Treatment of War Wounds. *J Orthop Trauma* 2008; 19: S138-141.
- Mechanisms of action:
 - Imposed tissue strain stimulating tissue mitogenesis and elaboration of growth factors.
 - Removal of excessive edema fluid.
 - Webb LX, Pape HC: Current thought Regarding the mechanism of Action of Negative Pressure Wound Therapy With Reticulated Open Foam. *J Orthop Trauma* 2008; 22: S135-S137.



Lateral fasciotomies



Single incision fasciotomy

- Centered over fibula.
- Superficial dissection can access anterior, lateral and superficial posterior compartments.
- Dissect posterior to fibula and release deep



Gastrocnemius flaps

- Rotational flaps within the zone of injury actually worked well and provided good coverage when needed.

– Burns TC, Stinner DJ, Possley DR, Mack AW, Eckel TT, Potter BK, Wenke JC, Hsu JR, STRac: Does the Zone of Injury in Combat-Related Type III Open Tibia Fractures Preclude the use of Local Soft Tissue Coverage. *J Orthop Trauma* 2010, 24: 697-703.



Bug juice in the wash

- Bacitracin versus castile soap in irrigation.
- No difference in infection rate between the groups.
- Bacitracin group was associated with a higher incidence of wound healing issues (9.5% versus 4%).

– Anglen JO: Comparison of soap and antibiotic solutions for irrigation of lower-limb open fracture wounds: A prospective, randomized study. *J. Bone Joint Surg* 87-A: 1415-1422, 2005.



High pressure lavage

- High-pressure pulsatile lavage causes considerable soft tissue penetration of particulate markers when compared with low-pressure lavage.

– Boyd JI 3rd, Wongworawat MD: High-Pressure Pulsatile Lavage Causes Soft Tissue Damage. *Clin Orthop*. 2004 Oct;1(427):13-17.



Combat protocols

- Timely and stable axial limb fixation
- Radical débridement of all compromised soft tissues and osseous structures
- Early wound closure with healthy, well-vascularized autologous tissue.

– Sherman R, Rahban S, Pollak AN: Timing of Wound Coverage in Extremity War Injuries. *J Am Acad Orthop Surg* September 2006 vol. 14 no. 10 S57-S61.



Damage Control

- External fixation to provide temporary stabilization of extremity injuries to mitigate systemic consequences of long bone injury in the context of physiologic instability that precludes safe, definitive treatment."

– Ficke JR, Pollak AN: "Extremity War Injuries: Development of Clinical Treatment Principles" *J Am Acad Orthop Surg* October 2007 vol. 15 no. 10 590-595.