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Less can be more Fluid Treatment in Polytrauma

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Overview

- Case Report
- Background
- Conclusions



Case Report



What happened?

- 32 year old healthy woman
- Afternoon walk with a friend and two dogs on an easy path in a canyon near the city of Brig in the Upper Valais
- Rock fall from the slopes over the path
- Immediately hit unconscious by just a very small stone

Case Report



What happened?

- Rolled down about 6 or 7 m the bank of the river (not very steep)
- Complete loss of muscle tonus
- Fall comes to a stop after touching a few small rocks, bushes and small trees
- Conscious again after a few minutes
- Moaning for headache in the beginning only

Case Report



What did we find?

- On arrival of the helicopter crew patient was conscious and could give proper answers
- Scalp wound of about 8 cm on top of the skull
- Retrograde amnesia
- Pale, low blood pressure of 80 mmHg, headache, chest and abdominal pain
- Reduced breathing on right thorax

Case Report

What did we do?

- Complete immobilisation
- Two bigger venous lines with very little saline infusion
- Getting ready a hypertonic solution (without starting it)
- Pain therapy by small doses of Fentanyl



Case Report

What did we do?

- Nothing about the thorax
- And nothing more on scene
- Evacuation in vacuum mattress and patient bag by long line operation
- 20 min transfer to the hospital of Sion (mayor trauma centre)



Case Report



During transfer to hospital

- Always conscious, answering on questions properly
- No signs of intracerebral injury
- Very pale
- Low blood pressure (70 to 80 mmHg)
- High heart rate (around 130 / min)

Case Report



During transfer to hospital

- Oxygen Saturation: 88 % under 10 l/min by face mask with reservoir
- No more than 100 ml of saline solution until arrival in hospital
- Still in the same condition as on the scene of the accident on arrival in hospital

Case Report



What happened in hospital?

- Starting infusion with a significantly higher rate than during rescue
- Blood pressure fell dramatically
- Patient became unconscious very quickly
- Intubation and thoracic drainage at the same time (evacuation of about 1 l of blood)
- No other diagnostics but quick sonography

Case Report



What happened in hospital?

- Findings of the sonography: clearly visible amount of free fluid in the abdomen
- Immediate surgical emergency intervention
- Findings: Liver laceration, splenic rupture, rupture of the right kidney with retroperitoneal haematoma

Case Report



What happened in hospital?

- Splenectomy, partial renal and liver resection, liver cauterisation
- Mass transfusion: 25 erythrocyte concentrates, several plasma samples and factor concentrates
- No further complications

Case Report

Outcome



- Extubation the next day
- Transfer to the regional hospital of Visp in a stable condition
- Patient at home after 13 days
- Full recovery, no significant remains

Background



Bloodloss

Lung, thorax
1000 ml each side

Liver, spleen
2000 ml each

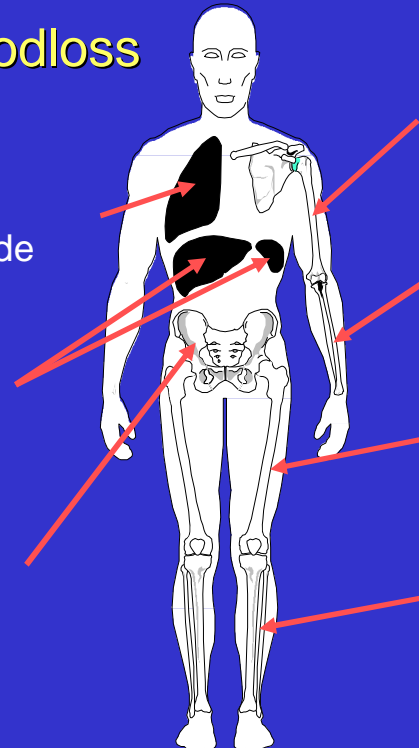
Pelvis
up to 5000 ml

Upper arm
800 ml

Forearm 400 ml

Upper leg 2000 ml

Lower leg 1000 ml



Background



Side effects of infusion therapy

- Higher bloodloss over injured vessels
- Reduced Clotting on the site of a vessel lesion
- Reduction of hematocrite and hemoglobine
- Loss and dilution of plasma factors
- Rising danger of hypothermia

Background



Principles

- Principle of **Permissive Hypotension**
- Principle of **Avoiding Rebleeding**
- Principle of **Small Volume Resuscitation**
(in stand by)
- ICAR recommendation “Fluid management in traumatic shock – a practical approach for mountain rescue” by Sumann G et al.

Background



Polytrauma with possible brain injury

- Brain perfusion has to be kept up
- Infusion with all its disadvantages
- Vasoactive substances
- Contrary to the treatment of polytrauma without brain injury



Conclusions

Conclusions



During rescue

- Very restrictive use of fluids
- Consciousness of the patient as the best monitoring
- Infusion was kept in stand-by but not used
- The problems of dilution and circulation collapse by fluid infusion and rebleeding could be avoided

Conclusions

In hospital

- The critical situation could be moved to hospital
- Complete management was feasible
- Surgical Emergency treatment available
- Blood products available





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Thank you for your attendance