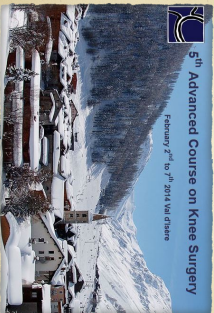


Respect for the soft tissue
Avoid bleeding



Dr. I. Ghiselsings AZ ALMA Ecklo
Belgium

American College of Surgeon's Classes of Acute Hemorrhage

Class	I	II	III	IV
Blood loss mL	≤ 750	750-1500	1500-2000	≥ 2000
% blood volume	≤ 15%	15-30%	30-45%	≥ 45%
Pulse rate	≤ 100	≥ 100	≥ 120	≥ 140
Blood pressure	Normal	Normal	Decreased	Decreased
Pulse Pressure	Normal or increased	Normal or increased	Decreased	Decreased
Capillary refill test	Normal	Normal	Prolonged	Prolonged
Respiratory rate	11-20	20-30	30-40	≥ 35
Urine output mL/kg	≥ 30	20-30	5 - 15	Negligible
CNS mental status	Alert	Alert	Mild confusion	Confused, delirious
Total replacement mL/kg	Crystalloid	Crystalloid	Crystalloid	Crystalloid + Blood

Anxious

"In the evening „at the bar“ we change the
world but the work has to be done in the
morning"

"The early bird catches the worm"



Avoid bleeding in TKA

- ~ Oozing wounds
- ~ Increased infection risks

Avoid bleeding in TKA

Why?

No blood no life

- ~ Pain
- ~ Swelling
- ~ Stiffness
- ~ Difficult and delayed rehab
- ~ Arthrofibrosis
- ~ Mental status

Avoid bleeding in TKA

- ~ Need for blood transfusion
- ~ Related complications

Avoid bleeding in TKA

So why?

- ~ Quicker recovery
- ~ Better results

How we avoid blood loss?

Pre-operative

- ▶ Pre-operative Hb & Hct level
- ▶ Anticoagulants
- ▶ Coagulopathy & platelet dysfunction
- ▶ Presence of inflammatory disease
- ▶ Hb stimulation (EPO, GSF...)
- ▶ ANH Pre-op "Acute normovolemic hemodilution"

No



How Quick

56 patients as a one day procedure

How we avoid blood loss?

General anesthesia (GA)

- ▶ GA just before incision
- ▶ Hypotension (≤ 80 mmHg)
- ▶ Max. muscle relaxation
- ▶ Laminar airflow
- ▶ Low temperature (18°)



How we avoid blood loss?

- ▶ Pre-operative
- ▶ General anesthesia
- ▶ No tourniquet
- ▶ Incision (EMS)
- ▶ Hemostasis
- ▶ Local topics
- ▶ Early mobilization



General anesthesia

No epidural anesthesia

Why?

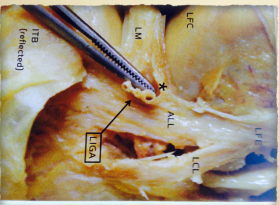
- Vasodilation
- Tension control
- Muscle relaxation
- No catheters

Hemostasis

Surgical

Avoid this complex by leaving a lateral rim of the meniscus

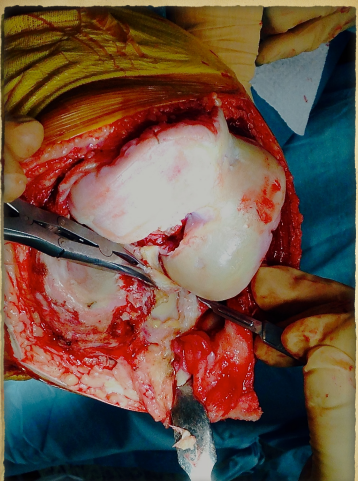
Courtesy Dr. S. Claes



Hemostasis

Tissue sealing

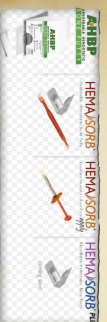
Too expensive for Belgium



Hemostasis

Mechanical

- ☐ Bone Wax
- ☐ Osteone (Alkyene Oxid Polyurethane)
- ☐ Hemisorb



Hemostasis

Cauterisation

Electrocautery

- ☒ Monopolar
- ☐ Bipolar
- ☒ Spray



Hemostasis

in wound management traces back to 1909 when Berget³ reported on the hemostatic effect of fibrin powder. In 1915, Grey³¹ and in 1916, Harvey³³, both from the United States, employed fibrin or fibrin patches to stop bleeding in the brain and parenchymatous organs. It took more than two decades for



How we avoid blood loss?

Early mobilisation

Vasoconstriction

How we avoid blood loss?

Local topics

- Vasoconstrictor
- Ropivacaine
- Adrenaline
- MgSO₄
- Anti-fibrinolytic
- Tranexamic Acid

How we avoid blood losses?

Early mobilisation

The way to heaven is through hell

Thank You

How we avoid blood loss?

Postoperative

- No drains
- No cell saver or re-transfusion