

EOS in inhibitor pts

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PWH today...



Adults (arthropathy)



Kids on prophylaxis (Micro-bleeds) ??



Inhibitor pts

Adult

- Management of daily life
- Physical activity
- Monitoring of target joint:
 - RX -RMN -TAC
- Periodic cycles of FKT
- Pre - rehabilitation
- Post - surgical



Kids

- Sport education
- Monitoring target joints:
 - Baropodometry
 - Ultrasound
 - Gait analysis



European Study on the Orthopaedic Status of patients with haemophilia and inhibitors

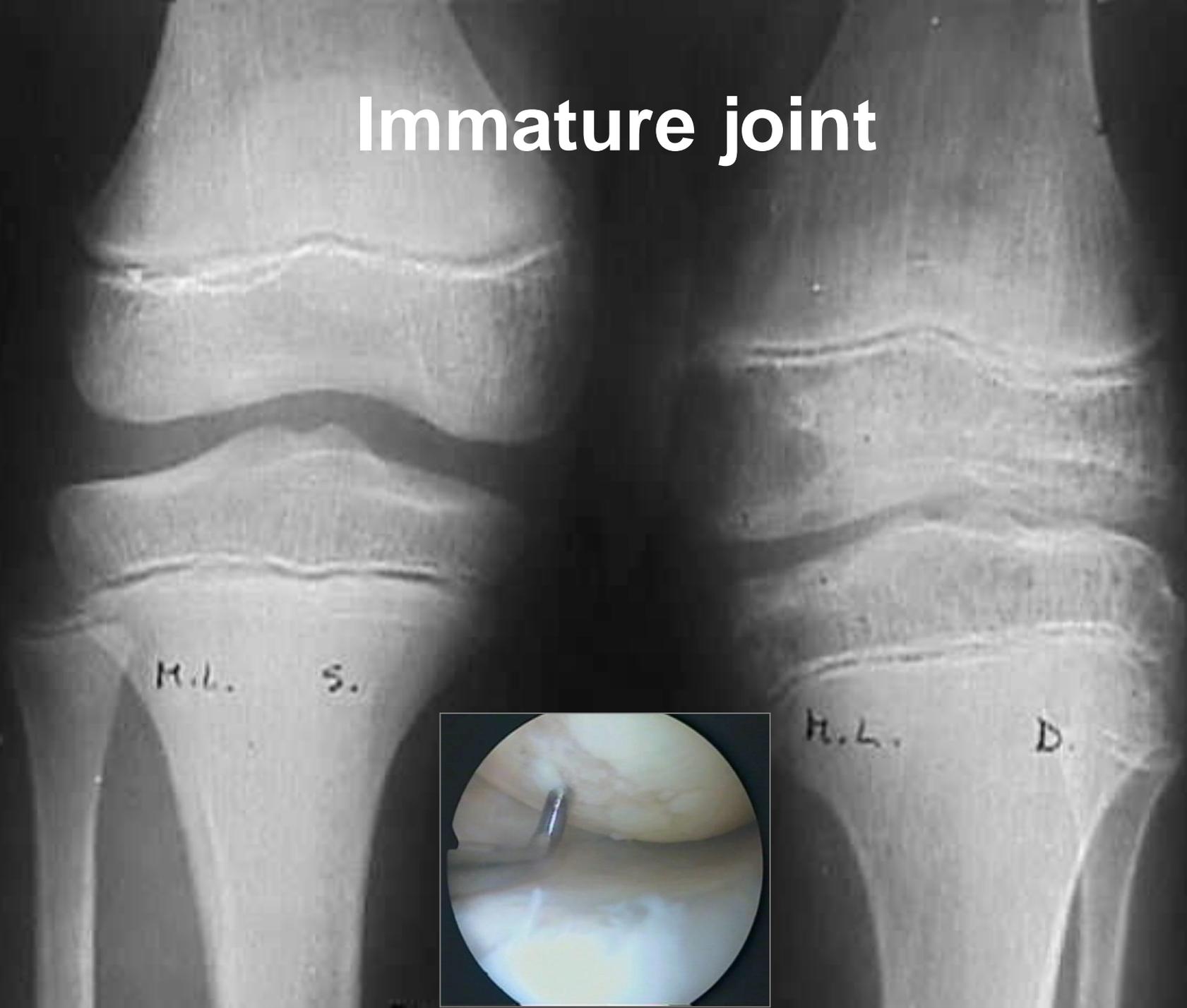
“The burden of orthopaedic complications and the impact on quality of life are more severe in patients with haemophilia who have developed an inhibitor compared with those patients without inhibitors.”

Pts with INH with a history of orthopaedic procedures or surgery:

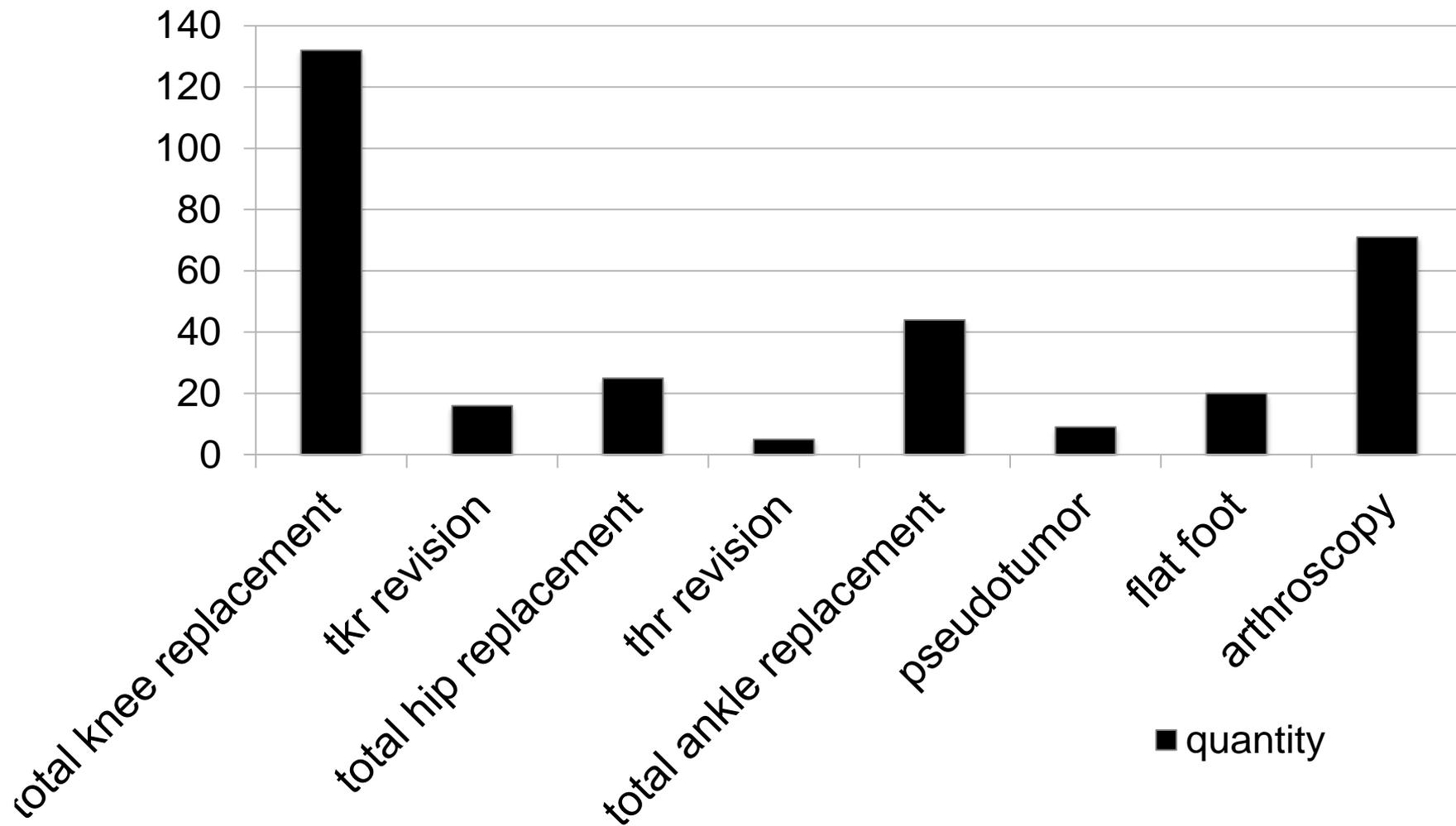
14-35 years: 34%

36-65 years: 66%

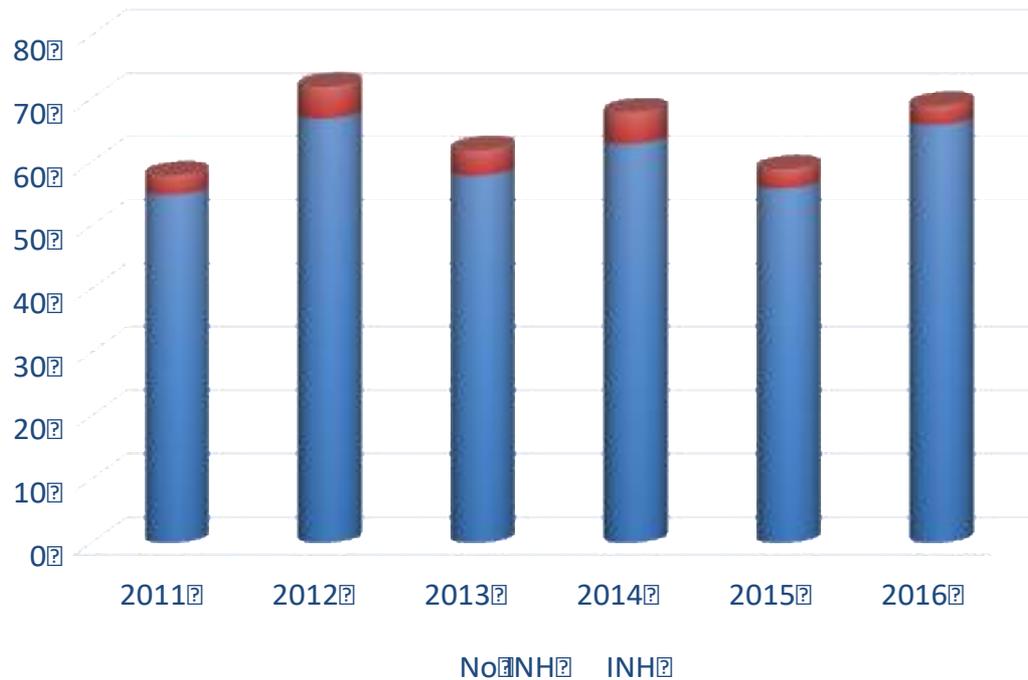
Immature joint



Our experience 2009-2016



Pts without INH vs pts with INH (last years)



	no INH	INH
2011	55	3
2012	67	5
2013	58	4
2014	63	5
2015	56	3
2016	66	3

Why?

Successful ITI

Other hematological treatment
for inhibitor

Cost

Complication management



Factor influencing surgeries in PWH

- Factor replacement (or by-passing agents) availability
 - Hemophilia center: number of pts
 - Team learning curve
 - Surgeon attitude
 - Hematologist attitude
-

MDA :What the hematologist has to know about...

- Stiffness
- Axial deviation
- Deformity
- Soft tissue release
- Bone cut
- Synovectomy



Increase bleed expectation...

What the hematologist has to know about...

Surgery

Total knee replacement	Primary implant
	Revision
Arthroscopy:	Synovectomy
	Debridment
Different bleeding expectation:	< 500 cc
	500 - 800 cc
	800 - 1200 cc



Knee / Ankle



What the surgeon has to know

- ✓ Severity of coagulation factor deficiency
 - on demand or prophylaxis mild hemophilia?
- ✓ Comcominant liver disease
 - HBV+/HCV+
 - Liver dysfunction
 - Cirrhosis
 - Thrombocytopenia
- ✓ Concomitant HIV infection
 - CD4
 - CD8
 - HIV viremia



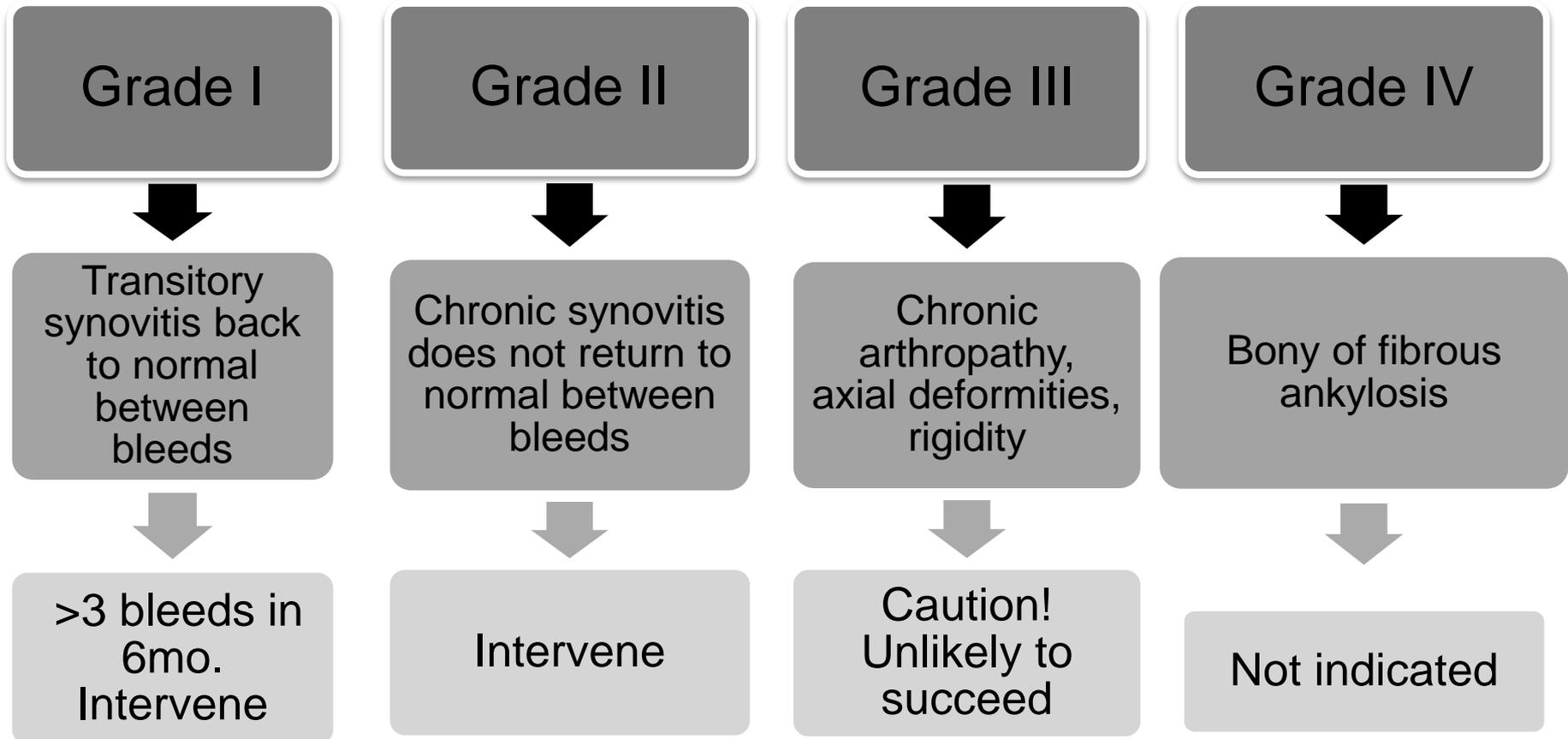
What the surgeon has to know

- ✓ Information on inhibitor history and current inhibitor status
 - Inhibitor titer
 - Anamnestic response
 - Choice of hemostatic therapy

- ✓ Choice of replacement therapy
 - Bolus vs CI
 - In inhibitor pts: high dose factor replacement by-passing agents



Treatment of synovitis



*Fernández-Palazzi, Hemophilia, 1998

Treatment options

Prophylaxis upgrade treatment

??? In inh pts

Arthrocentesis

Synoviorthesis

- Chemical synovectomy
- Radio synovectomy

Synovectomy

- Arthroscopic
- Open

Angiographic embolization

TKR

Angiographic Embolization

Cardiovasc Intervent Radiol. 2013 Aug;36(4):964-9. doi: 10.1007/s00270-012-0480-3. Epub 2012 Nov 13.

Hemophilic chronic synovitis: therapy of hemarthrosis using endovascular embolization of knee and elbow arteries.

Galli E¹, Baques A, Moretti N, Candela M, Caviglia H.



Selective angiographic embolization of knee and elbow arteries is a feasible procedure that can prevent repetitive bleedings

Home message

Synovectomy

↓ bleeding tendency

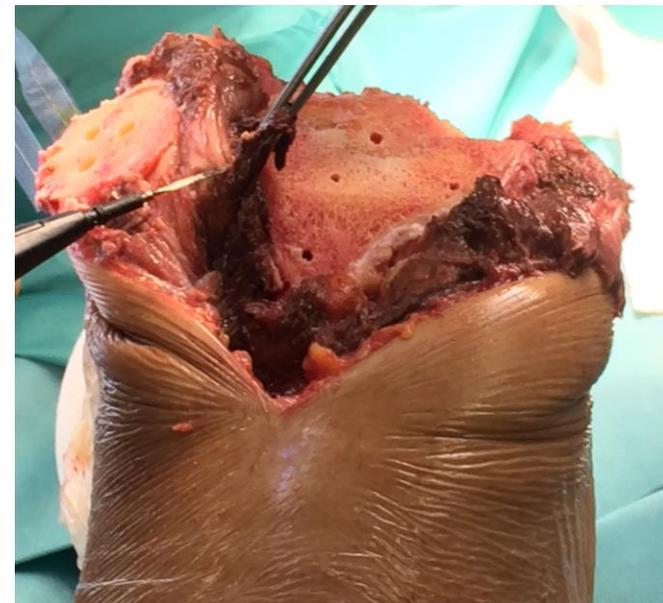
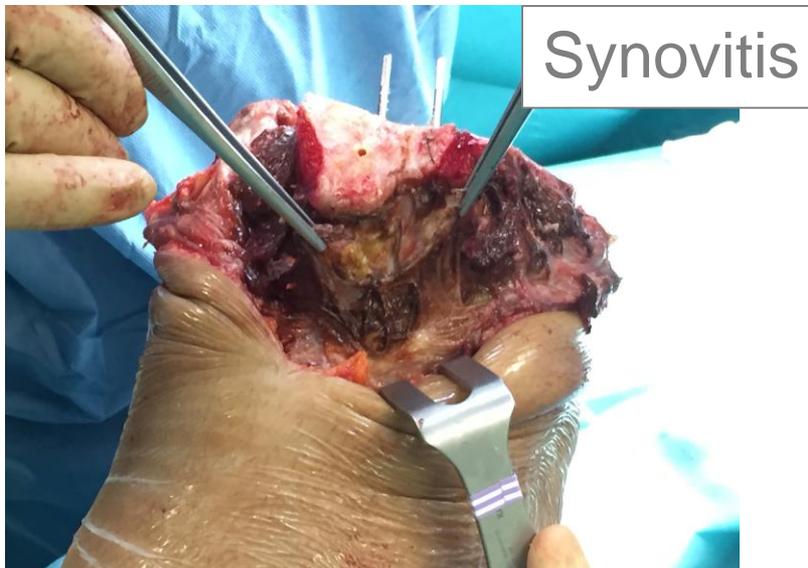
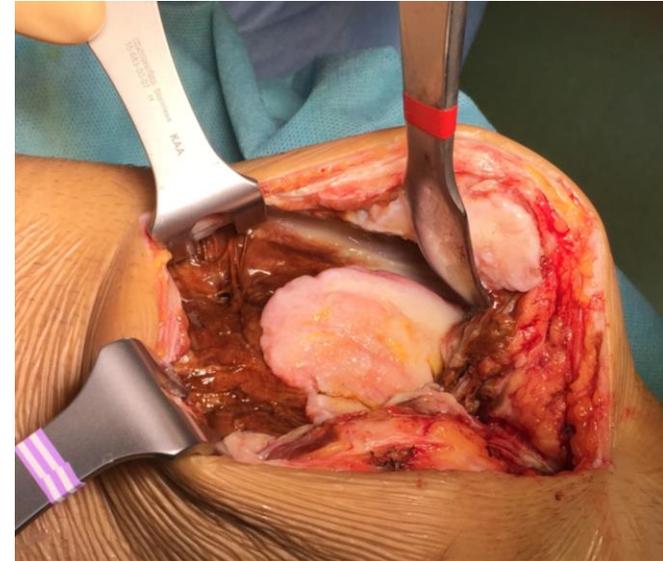
progressive deterioration of the
radiographic appearance

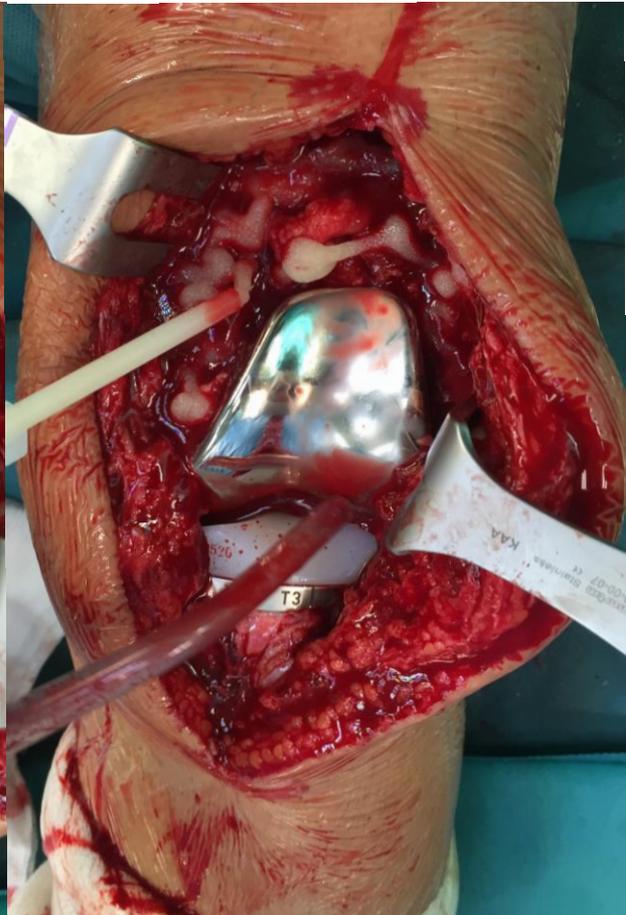
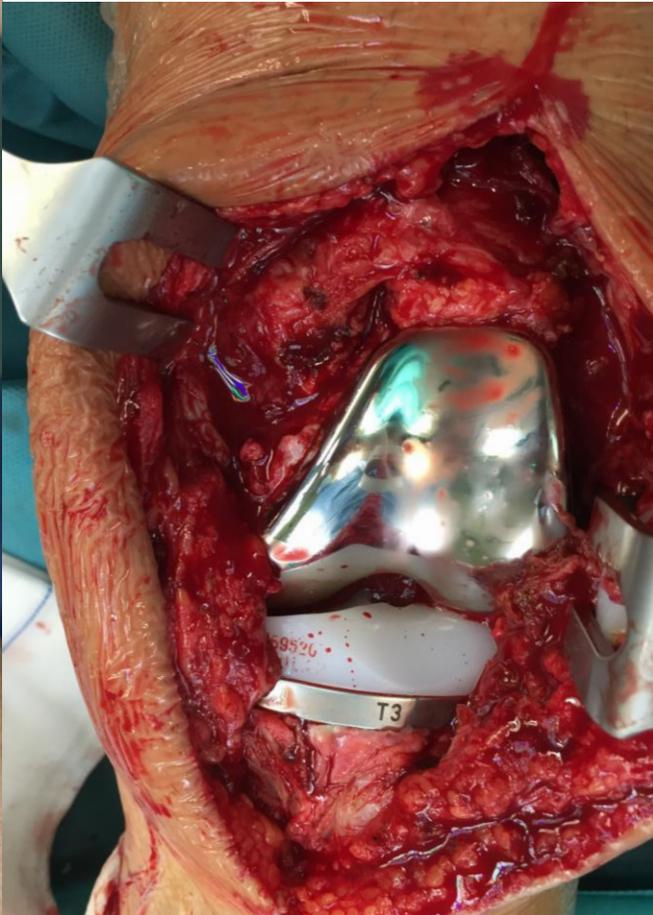
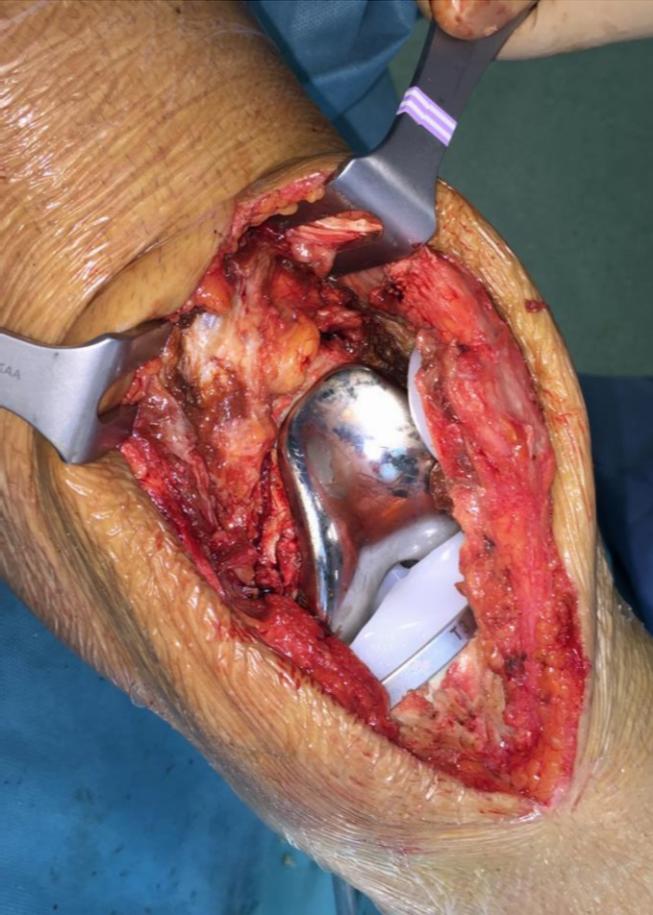


Chronic synovitis in advanced stage of arthropathy

TKR

- Higher expected bleeding
- Post-op swelling
- Drain management
- Fibrin seal

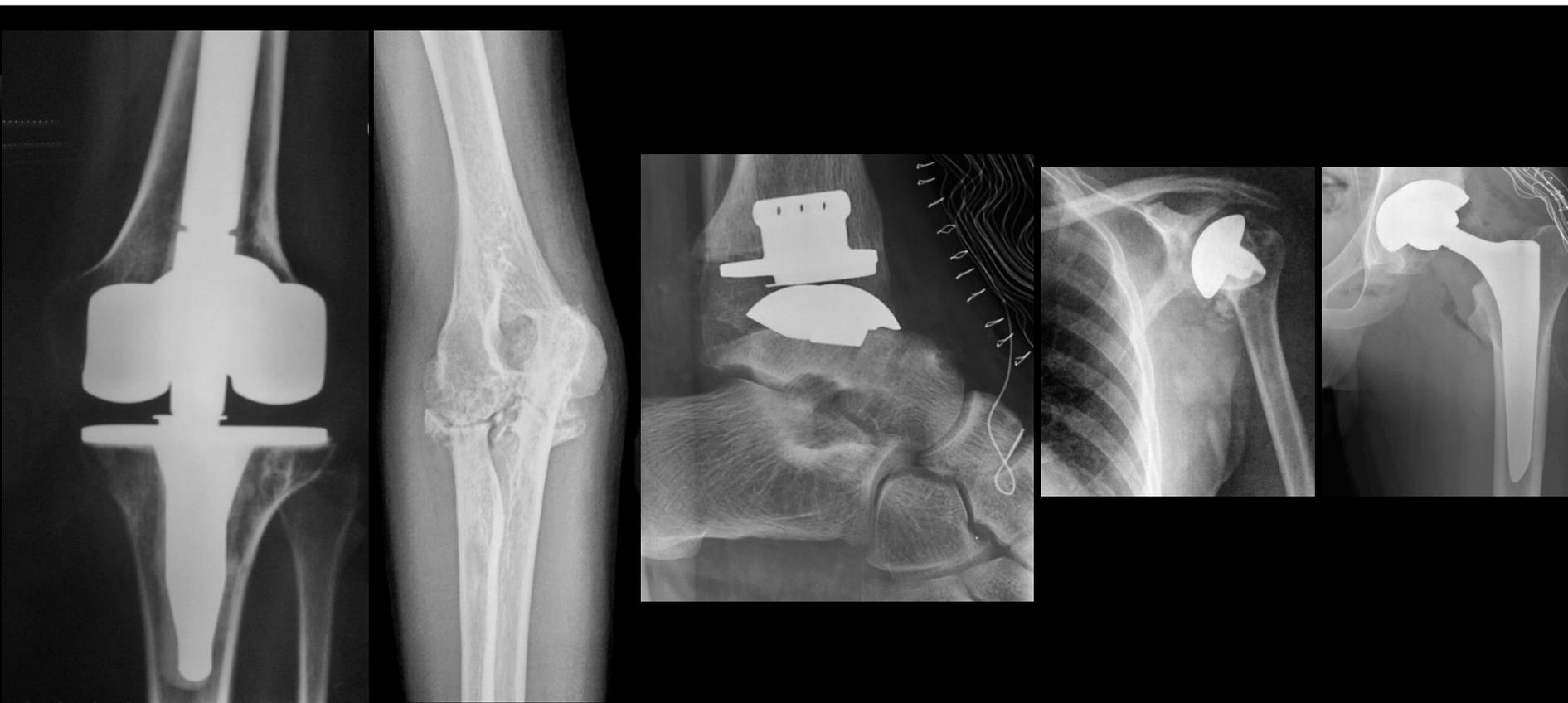




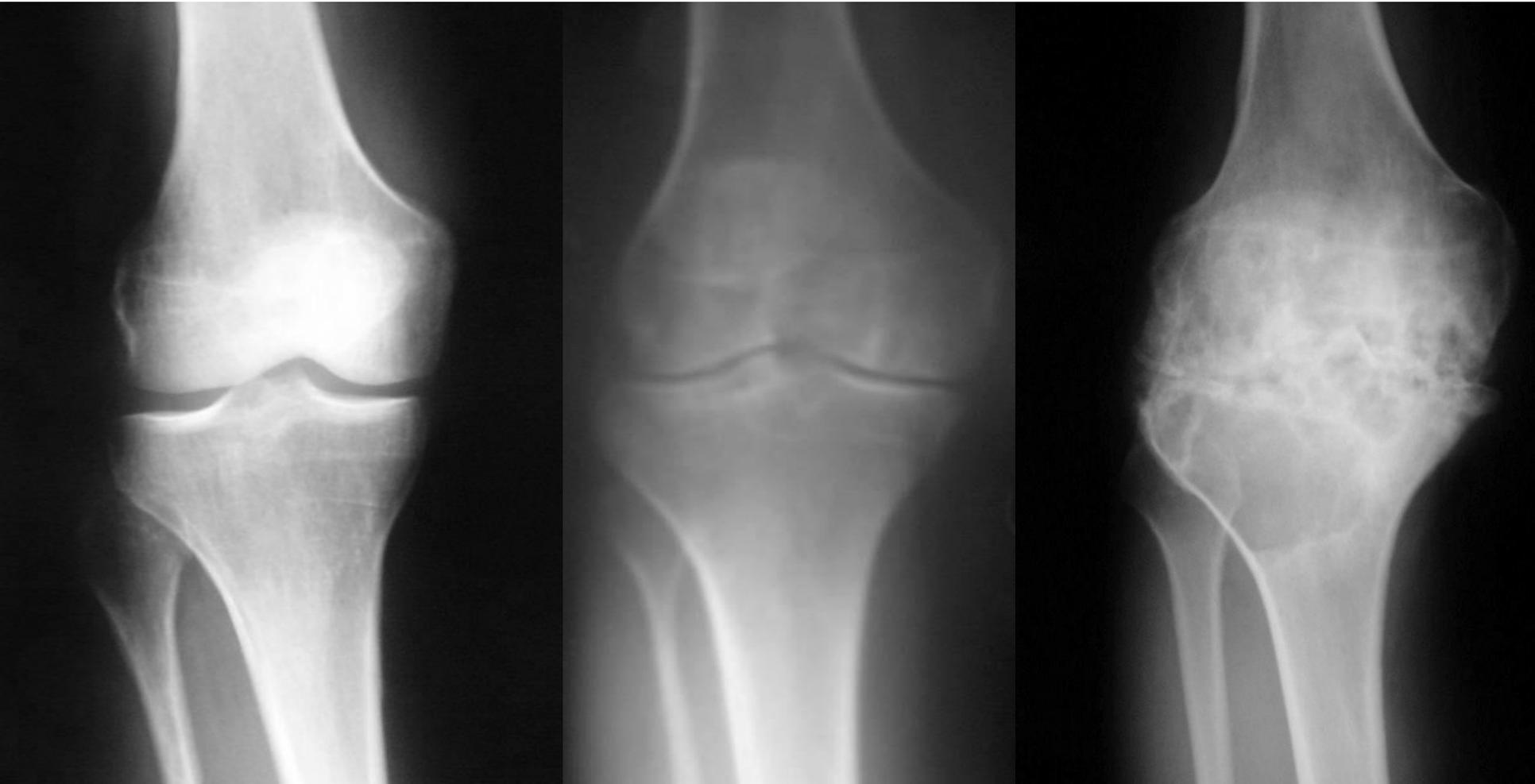
After synovectomy

Target joints

Neglected joints



X - ray: HA evolution monitoring Surgery timing



X - ray: HA evolution monitoring Surgery timing

Arthroscopy



Arthroscopy/TAR



TAR/fusion



Correlation between x-ray and clinical exam

Advanced deformity and joint stiffness



Advanced stage of arthropathy



No correlation between x-ray and clinical exam

good function-no pain



advanced stage of
arthropathy



Post-op

NSAIDs	No
Crural analgesia	No
Antithromboembolic prophylaxis	No/yes

Early Rehab	No
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Guideline	No
Pts and bleeding related	Yes

Factors influencing the long-term outcome of primary total knee replacement in haemophiliacs: a review of 116 procedures at a single institution

Luigi P. Solimeno,¹ Maria E. Mancuso,²
Gianluigi Pasta,³ Elena Santagostino,²
Samantha Perfetto¹ and
Pier Mannuccio Mannucci²

- 22 years: 1993 – 2007
- 116 primary TKR / 92 pts (INH and no INH)
- different types of implants (considering bone stock, axial deviation and instability)
 - cemented or cementless,
 - cruciate-retaining
 - posterior-stabilized
 - constrained
- Lost follow—up: none

*TKR, in the
past...*

Conclusions: TKR

Risk of complications was related to:



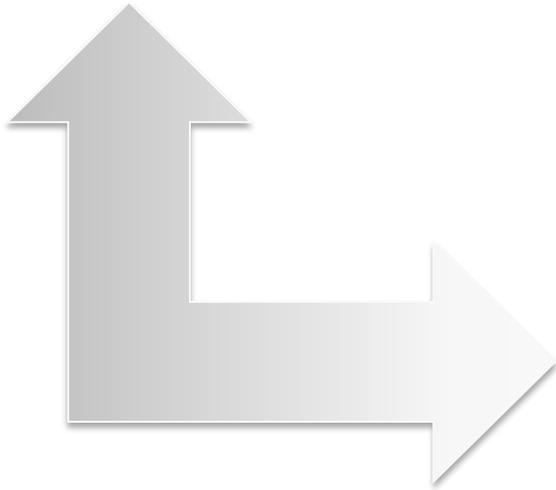
- ✓ Presence of inhibitors
- ✓ Continuous infusion
- ✓ Cementless implant
- ✓ Different primary surgeons



TKR, in the past...

Our experience in PWH and INH

16 years: 1997-2016



53 major surgeries / 32 pts

- 21 TJR: 18 TKR
1 THR
2 TAR
- 4 Revision
- 11 Arthroscopic
Procedures
- 17 Miscellaneous

Surgery in inhibitor pts

1997-2001

- TKR: 3/6 infections
- TKR: 1/6 aseptic loosening

2006-2016

- TJR: 3/21 infections
- TJR: 1/21 aseptic loosening

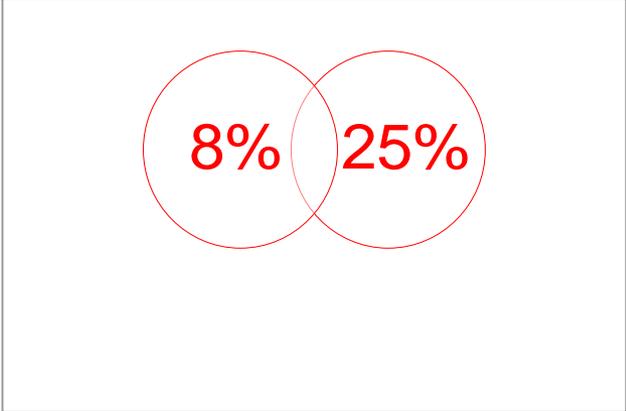
Complication rate

Same post-op
bleeding
complication

Different
management of
post-op bleeding
complication



?



?

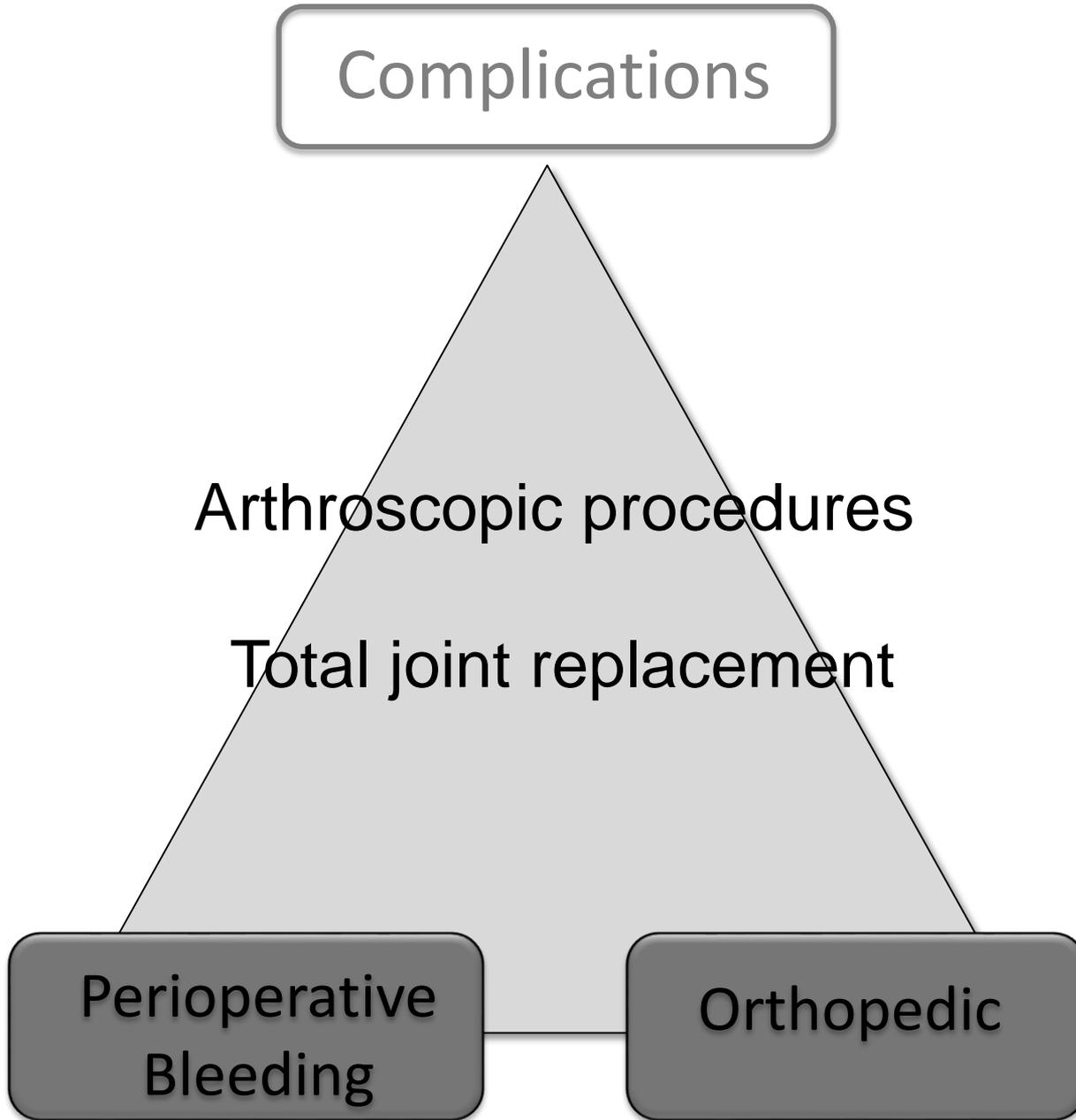
Complications

Arthroscopic procedures

Total joint replacement

Perioperative
Bleeding

Orthopedic



Complications: arthroscopic procedures



Prolonged post-op bleeding



Haematoma



Blood transfusion needed



Delayed rehab



Complications: bleeding after arthroscopic procedures

Hematological management

- Tranexamic acid
- Increase rFVIIa dosage
- Decrease administration interval
- Shift to APCC
- Add APCC

Orthopaedic treatment

- Ice
- Elevation
- Bendage
- Splint
- Delay rehab
- Drain management
- Arthrocentesis
- Post-op embolization

Prevention: *embolization*

Complications in Total Joint Replacement

Early

Knee

- ✓ Post-op bleeding
- ✓ Haematoma
- ✓ Early infection:
superficial
deep

Ankle

- ✓ Fracture
- ✓ Wound healing

Late

Knee/Ankle

- ✓ Aseptic loosening
- ✓ Septic loosening



Sir John Charnley

*“Hematoma
means
death of
surgeon”*

Life style related ??

Complications: bleeding after TKR

Hematological management:

- Tranexamic acid
- Increase rFVIIa dosage
- Decrease administration interval
- Shift to APCC
- Add APCC

Orthopaedic treatment:

- Ice
- Elevation
- Bendage
- Splint
- Delay rehab
- Drain management
- *Arthrocentesis*
- Post-op embolization

Avoid !!!

Prevention: *embolization*

Comments

- Major bleeding

after 17 procedures on 18 TKR

after 4 procedures (36%) in 4 patients who underwent to arthroscopy

- TKR

100% advanced arthropathy (Pettersson score 10-13)

100% flexion deformity

Comments

median **drop in hemoglobin** levels after surgery was:

- 7.3 g/dl (IQR: 3.7-10.8) for TKR
- 4.8 g/dl (IQR: 1.2-6.2) for arthroscopy

red blood cell transfusions were required following :

- 17 on 18 TKRs (92%)
- 4 arthroscopic procedures (36%, 50% of knee procedures).

Comments

- This surgical series shows how the **results changed during years** according to changes in haematological treatment and peri-operative management.
 - During the first years of experience 3 infections after knee replacement were registered (1 early – 2 late)
-
- lower median age of inhibitor patients with non-inhibitor patients confirmed the **higher severity of arthropathy**
 - the **type of used implants** is not different in the two population
 - **longer period of hospital stay** registered shows the need of a careful post-operative management.

Comments

According to our experience

- **knee** arthroscopy: **risk for bleeding**
ineffective
- **ankle** arthroscopy : **effective** in order to reduce **joint bleedings**
pain
- In order to reduce bleeding complication after replacement and arthroscopic surgery of the knee, it could be advisable to use **angiographic embolization**.

Thank u for your attention!

