



Luxace kolenního kloubu

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Anamnéza

Etiologie úrazu

- high vs. low energy trauma

Mechanismus úrazu

- hyperextenze, varus, valgus, dashboard injury

Přednemocniční péče

- urgentní transport do trauma centra



Klasifikace

1. Poziční (positional)

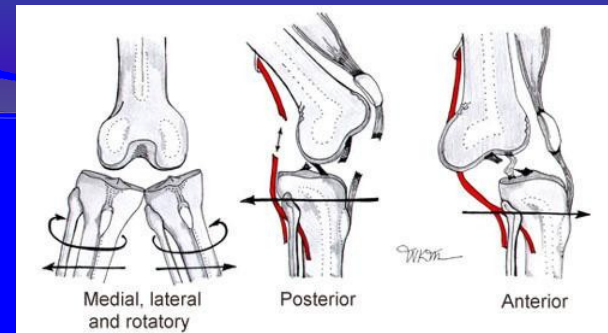
Complete Dislocation of the Knee Joint, **J. C. KENNEDY**, *J Bone Joint Surg Am*, 1963 Jul; 45 (5): 889 -904 .

- Přední(40%), zadní(33%), mediální(4%), laterální(18%), rotační(5%)

2. Anatomická

Knee Dislocations, Lessons Learned From 20-Year Follow-up

Robert C. Schenck Jr,* MD, Dustin L. Richter,* MD, and Daniel C. Wascher,*† MD Investigation performed at the University of New Mexico School of Medicine, Albuquerque, New Mexico, USA



- Otevřená vs. zavřená luxace
- Luxační zlomenina (18%)

TABLE 1
Anatomic Classification of Knee Dislocations^a

Class ^b	Injury
KD I	PCL or ACL intact knee dislocation Variable collateral involvement
KD II	Both cruciates torn, collaterals intact
KD III	Both cruciates torn, 1 collateral torn Subset M (medial) or L (lateral)
KD IV	All 4 ligaments torn
KD V	Knee fracture-dislocation

^aACL, anterior cruciate ligament; KD, knee dislocation; PCL, posterior cruciate ligament.

^bSubtypes: C, arterial injury; N, neurologic injury.

- KD I – většinou intaktní PCL, nízké riziko poranění peroneálního nervu a a. poplitey, rekonstrukce vazů odloženě
- KD II - vzácný typ
- KD III – M nebo L typ, často poranění peroneálního nervu, L typ horší funkční výsledky
- KD IV – high energy trauma

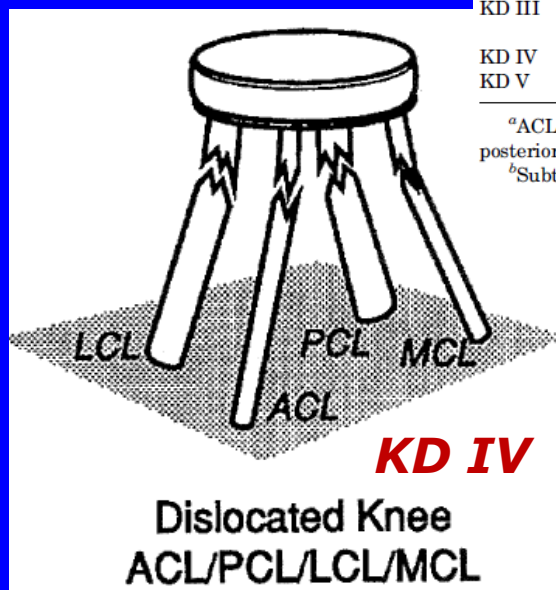
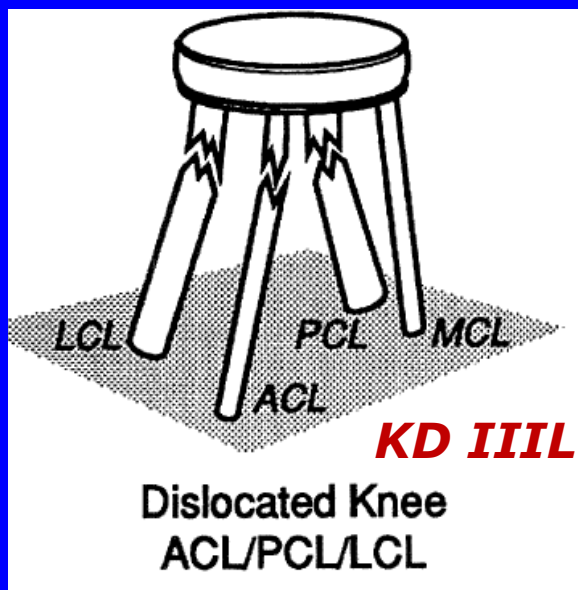


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Klinické vyšetření

- Deformita, otok, hematoma, nestabilita

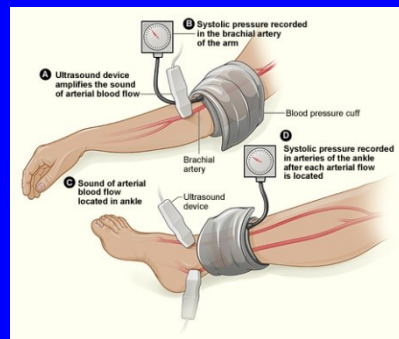
- Cévní vyšetření – poranění a. poplitea 7-64%

27% pacientů má hmatatelný puls při poranění a. poplitea

Jones RE, Smith EC, Bone GE. Vascular and orthopedic complications of knee dislocation. Surg Gynecol Obstet. 1979;149:554-558.

- Ankle-brachial index - menší než 0.9

$$ABPI_{Leg} = \frac{P_{Leg}}{P_{Arm}}$$



- Neurologické vyšetření – poranění n. peroneus 10-40%
- Celkové klinické vyšetření

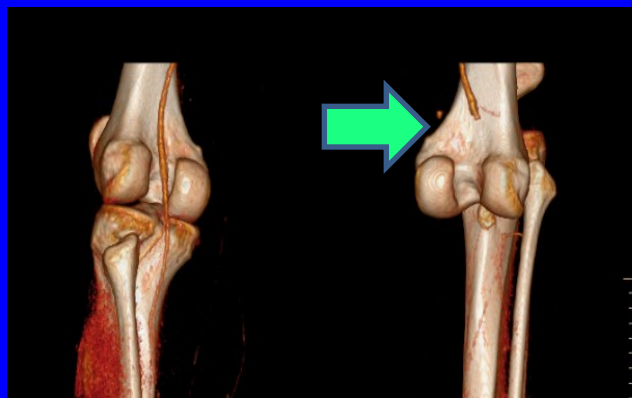
Mangled Extremity Severity Score (MESS)				
Type	Characteristics	Injury	Points	
1	Low energy	stab wound, simple closed fx, small-caliber GSW	1	
2	Medium energy	Open/multilevel fx, dislocation, moderate crush	2	
3	High energy	shotgun, high-velocity GSW	3	
4	Massive crush	Logging, railroad, oil rig accidents	4	
Shock Group				
1	Normotensive	Transiently	BP stable	0
2	hypotensive	Prolonged	BP unstable in field but responsive to fluid	1
3	hypotension	Prolonged	SBP <90mmHg in field and responsive to IV fluids in OR	2
Ischemia Group				
1	None		Pulsatile, no signs of ischemia	1
2	Mild		Diminished pulses without signs of ischemia	2
3	Moderate		No dopplerable pulse, sluggish cap refill, paresthesia, diminished motor activity	3
4	Advanced		Pulseless, cool, paralyzed, numb without cap refill	4
Age Group				
1	<30y/o			0
2	>30 <50			1

MESS score: six or less consistent with a salvageable limb. Seven or greater amputation generally the eventual result.

From Helfet DL, Clin Orthop 1990 256:80

Paraklinické vyšetření

- **RTG**
- Duplex UZ – 100% senzitivita, 97% specifická
- **CT angiografie** - 100 % senzitivita, 98.7% specifická



- **MRI**

Stannard JP, Sheils TM, Lopez-Ben RR, McGwin G Jr., Robinson JR, Volgas DA.
Vascular injuries in knee dislocations: the role of physical examination in
determining the need for arteriography.

J Bone Joint Surg Am. 2004;86-A:910-915.

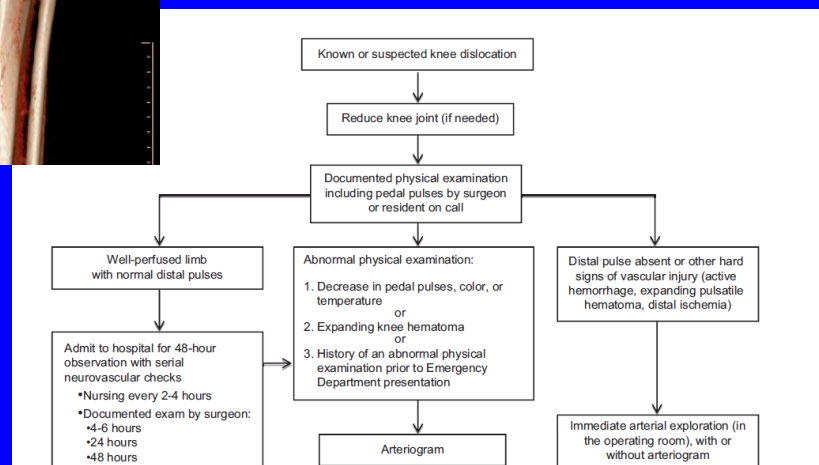


Figure 7. Standard protocol for selective arteriography.

Terapie



!!! Urgentní repozice !!!

Naložení bridge ZF – RTG kontrola
Flexe 20st.

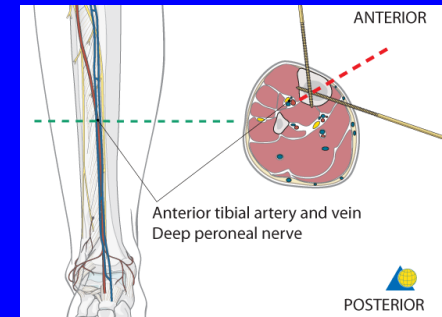
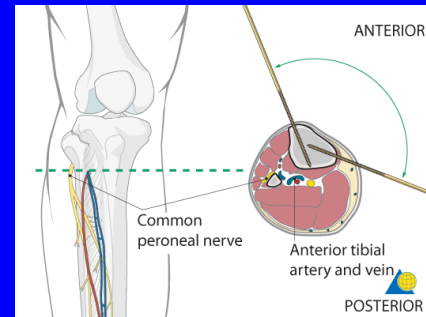
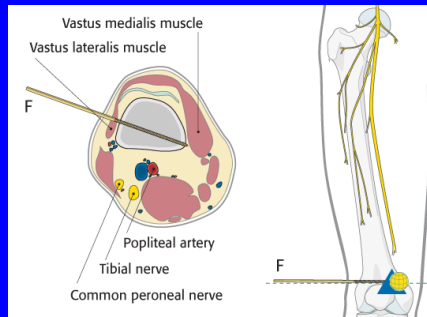
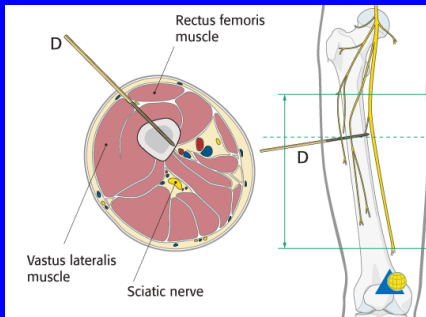
ultra-low trauma mechanismus – ortéza

Knee Dislocations. Lessons Learned From 20-Year Follow-up
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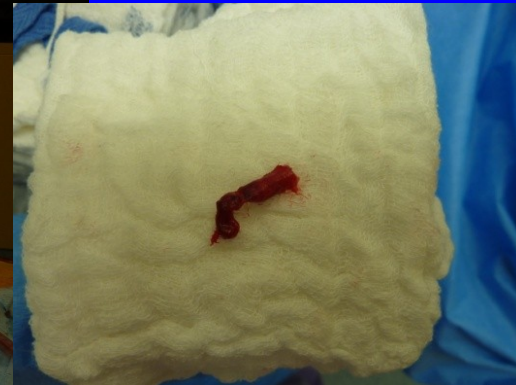
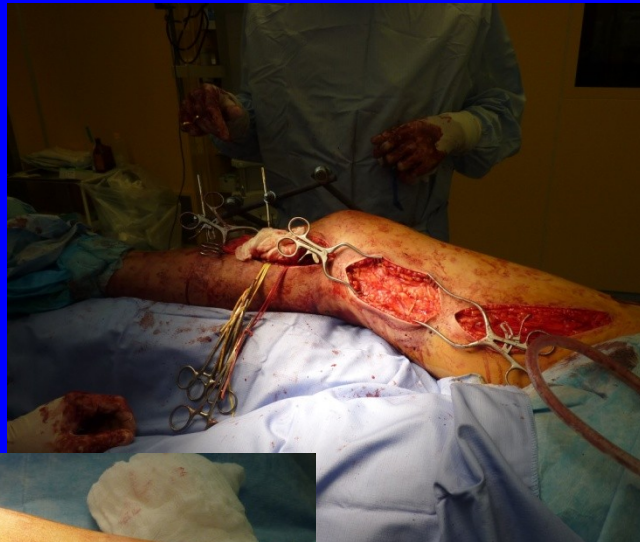
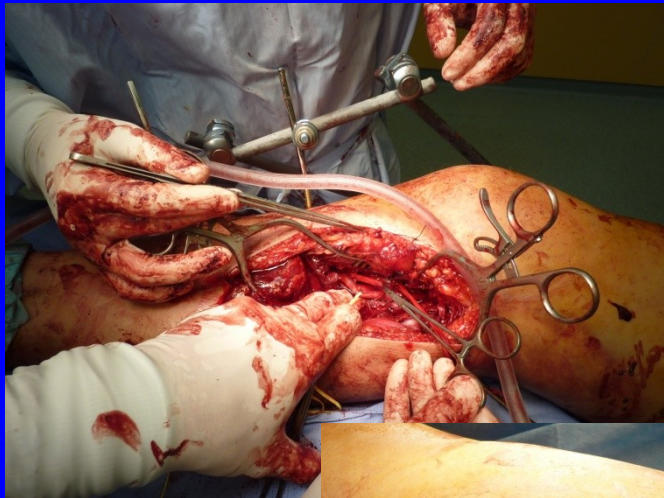
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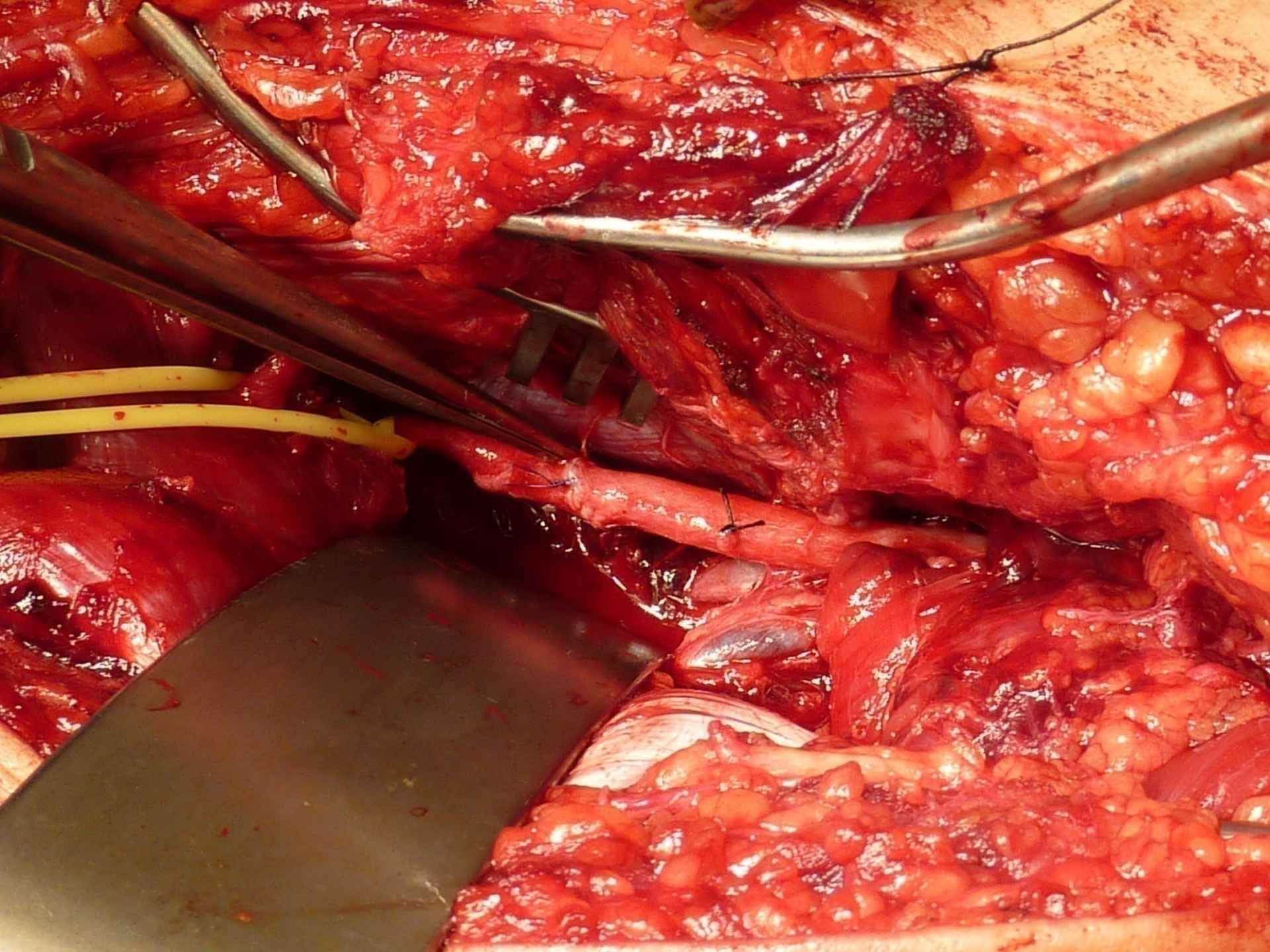
Terapie - revaskularizace

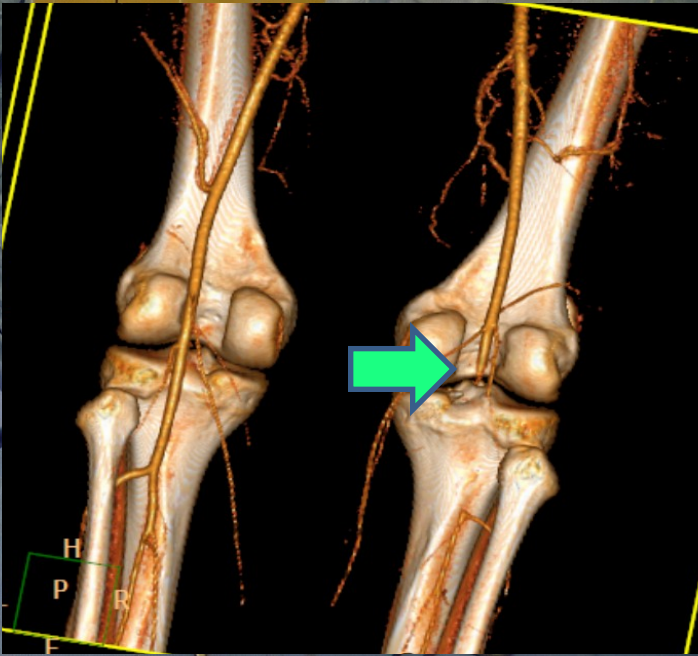


Revaskularizace do 8 hodin od úrazu – 80% pravděpodobnost záchrana končetiny

Revaskularizace od 8 hodin od úrazu – 80% pravděpodobnost amputace končetiny

Fasciotomie





Terapie – peroneální nerv

Management konzervativní léčby

stretching, dlahování, fyzikální terapie – prevence kontraktury

EMG za 6 týdnů od úrazu

Neurolyza, primární sutura, transplantace nervu, transfer šlachy MTP

Lepší funkční výsledek ??

Giuseffi SA, Bishop AT, Shin AY, Dahm DL, Stuart MJ, Levy BA. Surgical treatment of peroneal nerve palsy after knee dislocation. *Knee Surg Sports Traumatol Arthrosc.* 2010;18:1583-1586.

30% normalizace fce

Peskun CJ, Chahal J, Steinfeld ZY, Whelan DB. Risk factors for peroneal nerve injury and recovery in knee dislocation. *Clin Orthop Relat Res.* 2012;470:774-778.

Terapie – rekonstrukce vazů

- Časná rekonstrukce – RHB program

2-3 týdny od úrazu – lepší funkční výsledky

Howells NR, Brunton LR, Robinson J, Porteus AJ, Eldridge JD, Murray JR. Acute knee dislocation: an evidence based approach to the management of the multiligament injured knee. *Injury*. 2011;42: 1198-1204.

Chhabra A, Cha PS, Rihn JA, et al. Surgical management of knee dislocations: surgical technique. *J Bone Joint Surg Am*. 2005;87(suppl 1): 1-21.

Levy BA, Dajani KA, Whelan DB, et al. Decision making in the multiligament-injured knee: an evidence-based systematic review. *Arthroscopy*. 2009;25:430-438.

LCM – sutura pouze kompletní ruptury

Laterální komplex – vždy rekonstrukce - kotvy, sutura

Neurolýza peroneálního nervu

Rekonstrukce menisků, závěsů patelly

mediální artrotomie

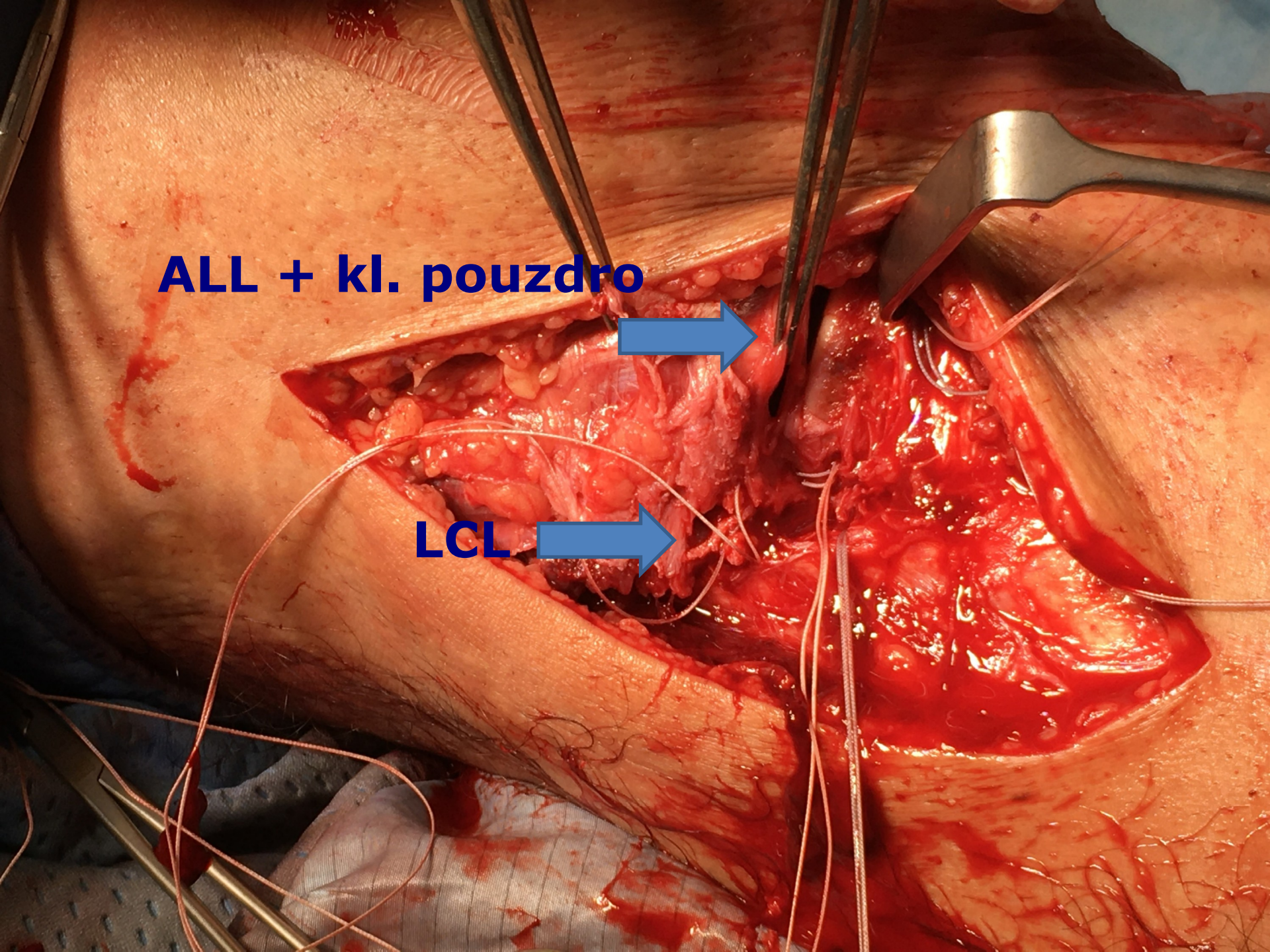
PCL – allograft achil. šlachy, ACL – allograft lig. patellae



ALL + kl. pouzdro



LCL



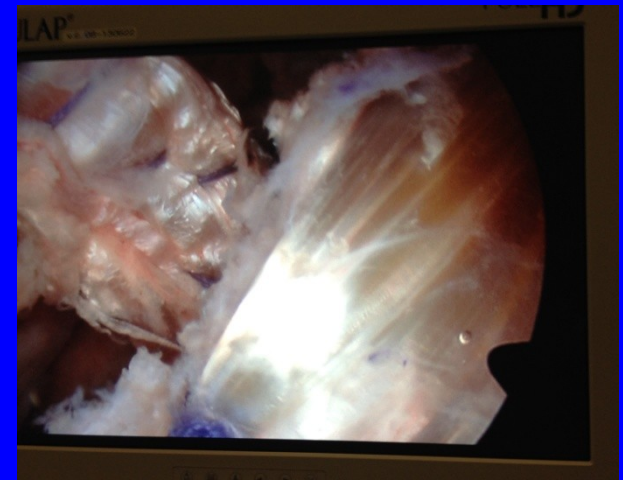
Terapie – rekonstrukce vazů

- Pozdní rekonstrukce - ASKP

6 týdnů – 3 měsíce

ACL, PCL – auto, allograft - lig. patellae, hamstringy

Kolat. vazy, posterolaterální komplex – obtížné, augmentační techniky



Rehabilitace

- Individuální !



- 1.den 0-30st. pasivně, ortéza limited motion(20st. flexe)
- 10.den 0-90st.
- Pasivní a aktivně asistované cviky 6 týdnů od úrazu
- Chůze o berlích bez došlapu - 6 týdnů, 0-120st.
- Plná zátěž bez berlí za 3 měsíce od úrazu
- 8-12 měsíc - bez omezení



Soubor pacientů

01/2010 – 01/2020

24 pacientů – 24 luxací

KDI – 3 pacienti (12.5%)

KDII – 1 pacient (4.2%)

KDIII – 3 pacienti (12.5%)

KDIV – 9 pacientů (37.5%)

KDV – 8 pacientů (33.3%)



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1 rok od úrazu

- Lysholm score 79%
(hodnoceno 20 pacientů)
- 60% (12 pacientů) dobré výsledky (84–100 bodů)
- 30% (6 pacientů) uspokojivé výsledky (65–83 bodů)
- 10% (2 pacienti) neuspokojivé výsledky (pod 65 bodů)

LYSHOLM KNEE SCORING SCALE

Instructions: Below are common complaints which people frequently have with their knee problems. Please check the statement which best describes your condition.

I. LIMP:	V. PAIN:
<input type="checkbox"/> I have no limp when I walk. (5)	<input type="checkbox"/> I have no pain in my knee. (25)
<input type="checkbox"/> I have a slight or periodical limp when I walk. (3)	<input type="checkbox"/> I have intermittent or slight pain in my knee during vigorous activities. (20)
<input type="checkbox"/> I have a severe and constant limp when I walk. (0)	<input type="checkbox"/> I have marked pain in my knee during vigorous activities. (15)
II. USING CANE OR CRUTCHES	<input type="checkbox"/> I have marked pain in my knee during or after walking more than 1 mile. (10)
<input type="checkbox"/> I do not use a cane or crutches. (5)	<input type="checkbox"/> I have marked pain in my knee during or after walking less than 1 mile. (5)
<input type="checkbox"/> I use a cane or crutches with some weight-bearing. (2)	<input type="checkbox"/> I have constant pain in my knee. (0)
<input type="checkbox"/> Putting weight on my hurt leg is impossible. (0)	VI. SWELLING
III. LOCKING SENSATION IN THE KNEE	<input type="checkbox"/> I have no swelling in my knee. (10)
<input type="checkbox"/> I have no locking and no catching sensations in my knee. (15)	<input type="checkbox"/> I have swelling in my knee only after vigorous activities. (6)
<input type="checkbox"/> I have catching sensations but no locking sensation in my knee. (10)	<input type="checkbox"/> I have swelling in my knee after ordinary activities. (2)
<input type="checkbox"/> My knee locks occasionally. (6)	<input type="checkbox"/> I have swelling constantly in my knee. (0)
<input type="checkbox"/> My knee locks frequently. (2)	VII. CLIMBING STAIRS:
<input type="checkbox"/> My knee feels locked at this moment. (0)	<input type="checkbox"/> I have no problems climbing stairs. (10)
IV. GIVING WAY SENSATION FROM THE KNEE	<input type="checkbox"/> I have slight problems climbing stairs. (6)
<input type="checkbox"/> My knee never gives way. (25)	<input type="checkbox"/> I can climb stairs only one at a time. (2)
<input type="checkbox"/> My knee rarely gives way, only during athletics or other vigorous activities. (20)	<input type="checkbox"/> Climbing stairs is impossible for me. (0)
<input type="checkbox"/> My knee frequently gives way during athletics or other vigorous activities, in turn I am unable to participate in these activities. (15)	VIII. SQUATTING
<input type="checkbox"/> My knee occasionally gives way during daily activities. (10)	<input type="checkbox"/> I have no problems squatting. (5)
<input type="checkbox"/> My knee often gives way during daily activities. (5)	<input type="checkbox"/> I have slight problems squatting. (4)
<input type="checkbox"/> My knee gives way every step I take. (0)	<input type="checkbox"/> I can not squat beyond a 90 degree bend in my knee. (2)
	<input type="checkbox"/> Squatting is impossible because of my knee. (0)

TOTAL ____/100

INSTRUCTIONS: Please place an X on the line to indicate the amount of pain you have had in your knee(s) the past 24 hours. The scale ranges from "no pain at all" to the "worst possible pain".

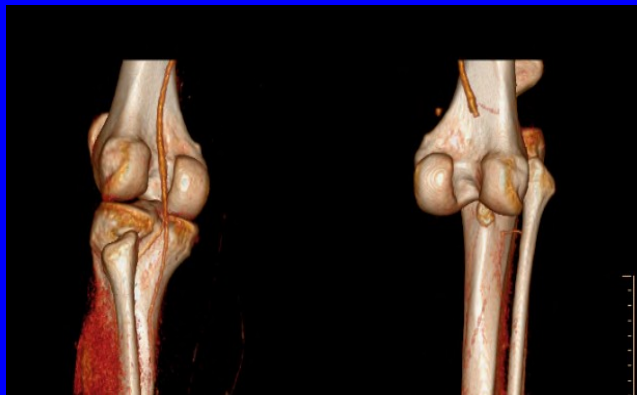
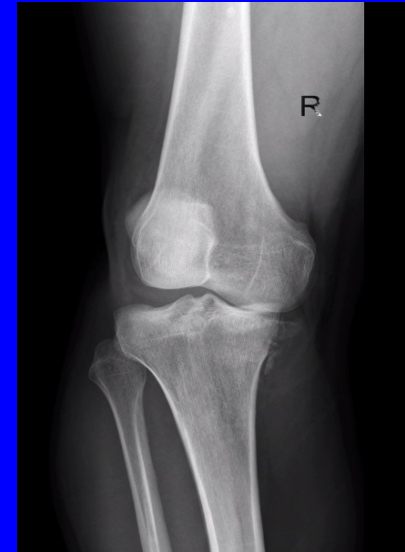
RIGHT KNEE _____
no pain worst possible pain

LEFT KNEE _____
no pain worst possible pain

Komplikace

- *Poranění a. poplitea* 7x (29.2%)
- *Poranění n. peroneus (tibialis)* 4x (16.7%)
- *Fasciotomie* 7x (29.2%)
- *Infekce* 5x (20.8%)

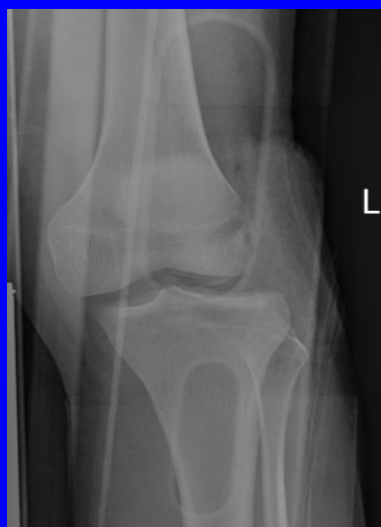
- *Amputace končetiny* 1x (4.2%)
- *Plicní embolie(exitus)* 1x (4.2%)





Závěr

- Individuální přístup
- Časná rekonstrukce vazů
- Odborně vedená RHB
- 60-70% pacientů mají stabilní a nebolestivé koleno



Děkuji za pozornost !

