

AKTUELLE STRATEGIEN in der  
INFEKTDIAGNOSTIK nach BANDPLASTIK

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WAS ist eine INFEKTION ?  
KLINISCHE DIAGNOSTIK

RÖTUNG

SCHWELLUNG

ÜBERWÄRMUNG

SCHMERZ

FUNKTIONSEINSCHRÄNKUNG

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ACL RECONSTRUCTION  
INFECTION

N 112 ARTICLES 1984 - 2012

CASE REPORTS	n 41
<b>INZIDENZ 0.29% - 1.4%</b>	
TUNNEL REACTION to SCREWS	n 27
RETROSPECTIVE DATENANALYSE	n 9
VERSCHIEDENES	n 37

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Complications following anterior cruciate ligament reconstruction in the English NHS  
JAMESON SS et al Knee 2012

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n 13 941 ACL RECONSTRUCTION

→ DVT 0,30%

→ WOUND COMPLICATION 0,75%

→ INFECTION 1,36%

WASH OUT - NO GRAFT REMOVAL

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DIFFERENTE ERREGER

UNTERSCHIEDLICHE ZEIT bis zum AUSBRUCH der INFEKTION

UNTERSCHIEDLICHE AGGRESIVITÄT

UNTERSCHIEDLICHE VERLÄUFE

VIRALE versus BAKTERIELLE INFEKTION

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Clinical Presentation of Staphylococcus epidermidis Septic Arthritis Following Anterior Cruciate Ligament Reconstruction.  
KIM YM et al. Knee Surg Relat Res. 2012

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n 6 STAPHYLOCOCCUS EPIDERMIS following ACL RECONSTRUCTION

ON SET of SYMPTOMS 4,7 days (2-8d)

ASPIRATION → LAVAGE

CLINICAL SYMPTOMS IN VARYING DEGREES

CELL COUNT > 2200 80% POLYMORPHONUCLEAR

CONCLUSIONS: The symptoms, signs and laboratory findings of S. epidermidis septic arthritis following ACLR are nonspecific with various clinical presentations. So the diagnosis is often delayed. Positive gram staining can be used to confirm septic arthritis. Careful observation for septic arthritis is advised in case of presence of any abnormality after ACLR.

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Fungal osteomyelitis after arthroscopic  
anterior cruciate ligament reconstruction:  
case report with review of the literature

SUN L et al Knee 2012

INFECTION 18 days → following ACLR

AS-REMOVAL of GRAFT + FX  
IRRIGATION + SUCTION DRAINAGE

BONE DESTRUCTION after 48 days  
ASPERGILLUS HYPHAE

→ 12cm BONE RESUCTION  
ARTHRODESIS + LIMB LENGHTENING

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PROBLEM der INFEKTDIAGNOSTIK

⇒ ZEITPUNKT der KLINISCHEN DIAGNOSTIK

⇒ ZEITPUNKT der OBJEKTIVEN DIAGNOSTIK

OBJEKTIVE SCREENINGVERFAHREN  
EXSUDAT                      FARBE / ZELLZAHL  
LABOR                      CRP/ BSG /INTERLEUKIN

RÖNTGEN ?  
SONOGRAFIE ?  
MRI ?  
CT ?

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BESTEHT eine KORRELATION  
zwischen TRANSPLANTAT  
und INFEKT ?

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RISC and OUTCOME of INFECTION after  
DIFFERENT ACL  
RECONSTRUCTION TECHNIQUES  
Binnet et al. ARTHROSCOPY 2007

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n 1231 HARMSTRINGS - BTB - ALLOGRAFT  
4 - 24 days n 6 INFECTION

HARDWARE REMOVAL 5/6  
GRAFT REMOVAL 0/6  
REPEATED ARTHROSCOPIC LAVAGE  
ANTIBIOTICS LONG TIME

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INCIDENCE and OUTCOME after TREATMENT of  
all3 GROUPS were SIMILAR

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Infections and patellar tendon ruptures after  
anterior cruciate ligament reconstruction: a  
comparison of ipsilateral and contralateral  
patellar tendon autografts.  
BENNER RW et al. Am J Sports Med 2011

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LEVEL III

n 2553 IPSILATERAL PATELLAR TENDON AUTOGRAFT  
n 2811 CONRALATERAL PATELLAR TENDON AUTOGRAFT

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INFECTION 0,39% IPSILATERAL  
INFECTION 0,14% CONTRALATERAL

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NO SIGNIFICANT INCIDENCE DIFFERENCE

MORE EXTENSION DEFICIT in the IPSILATERAL GROUP

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Allograft compared with autograft infection  
rates in primary anterior cruciate ligament  
reconstruction.  
GREENBERG DD et al. J Bone Joint Surg Am 2012

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n 861 PATIENT FU - 6 MONTHS

25,6% AUTOGRAFT  
74,4% ALLOGRAFT

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NO SEPTIC INFECTION in EITHER GROUP

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The incidence of and clinical approach to positive allograft cultures in anterior cruciate ligament reconstruction  
FOWLER JR et al. Clin J Sport Med 2011

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n 3 / 115 ( 2.6% ) ALLOGRAFTS POSITIVE CULTURE

n 2 COAGULASE NEGATIVE  
n 1 E. COLI

→ NO CLINICAL INFECTION  
→ NO ANTIBIOTICS

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SIGNS + SYMPTOMS of SEPTIC ARTHRITIS SHOULD be THREATED AGRESSIVELY by REPEATED IRRIGATION + ANTIBIOTICS

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A surgical technique using presoaked vancomycin hamstring grafts to decrease the risk of infection after anterior cruciate ligament reconstruction.  
VERTULLO CJ et al. Arthroscopy 2012

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n1 285 PATIENTS ANTIBIOTICS iv.  
n2 870 PATIENTS ANTIBIOTICS iv.  
+ PRESOAKED HARMSTRING with VANCOMYCIN

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n1	→	4 INFECTIONS 1,4 %
n2	→	0 INFECTIONS 0,0 %

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STAPHYLOCOCCUS EPIDERMIS  
LAVAGE + ANTIBIOTICS iv.

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The in vitro elution characteristics of vancomycin from tendons  
GRAYSON JE et al. Clin Orthop Relat Res 2011

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BOVINE TENDONS were WRAPPED in STERILE GAUZE  
PRESOAKED with 1,25-5 mg/ml VANCOMYCIN SOLUTION  
ELUTION RATE 10 min → 1 hour

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VANCOMYCIN DIFFUSION RATE was DEPENDENT on SOAK SOLUTION CONCENTRATION not on TIME

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Micro-organism colonization and intraoperative contamination in patients undergoing arthroscopic anterior cruciate ligament reconstruction

NAKAYAMA H et al. Arthroscopy 2012

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n 50 SWABS PREOP. TAKEN SKIN + NOSE  
SWABS INTRAOP. SKIN CLOSE to INCISION

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POSITIVE CULTURE PREOP.	46% SKIN
	90% NOSE
INTRAOPERATIVE SKIN +GRAFT	6%

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Knee joint infection after ACL reconstruction: prevalence, management and functional outcomes

TORRES-CLARAMUNT R et al. Knee Surg Sports Traumatol Arthrosc 2012

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n 15 / 810 → ACL - INFECTION

n 10	STAPH. COAGULASE neg.
n 3	STAPH. AUREUS
n 1	PROBINE BACTERIUM
n 1	?

REPEATED ARTHROSCOPY n 15  
GRAFT REMOVAL n 1 / 15

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SEPTIC ARTHRITIS with STAPHYLOCOCCUS LUGDUNENSIS following ACL REVISION with BPTB ALLOGRAFT

MEI -DAN Oet al. Knee Surg Sports Traumatol Arthrosc 2008

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Staph lugdunensis -COAGULASE NEGATIVE  
predominantly infecting SCIN + SOFT TISSUE

MICROBIOLOGY LAB has to USE  
TUBE COAGULASE LONG TEST

OTHERWISE the ORGANISM is MISIDENTIFIED  
as STAPH.AUREUS ( less AGRESSIVE )

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LABOR SCREENING  
wiederholen

- BSG
- LEUKO
- CRP
- ZELLZAHL
- INTERLEUKIN

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Tunnel enlargement after anterior cruciate ligament reconstruction in patients with post-operative septic arthritis  
IORIO R et al. Knee Surg Sports Traumatol Arthrosc 2008

n 58 → NO INFECTION

BTB n 13	HARMSTRINGS n 45
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MEAN CRP 1st day POSTOP  
MAXIMUM PEAK 3rd day POSTOP  
DECREASE 7th day POSTOP

NO DIFFERENCE in RELATION to GRAFT

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PUNKTION

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- BAKTERIOLOGISCHE UNTERSUCHUNG

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- ARHTROSKOPISCHE LAVAGE (BAKTERIOLOGIE + HISTOLOGIE)

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AKUTER INFEKT



LAVAGE + BIOPSIE (histo +bakt.)  
iv.ANTIBIOSE

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**TUBERCULAR** infection after arthroscopic  
anterior cruciate ligament reconstruction  
NAG HL et al. Arthroscopy 2009

n 8 / 1152 ACL  
BTB n 1 HARMSTRINGS n 7

SURGERY → PRESENTATION 64,4 32 - 152 days

ASPIRATION FLUID NEGATIVE  
SYNOVIAL TISSUE POSITIVE n 3  
CHARACTERISTIC HISTOPATHOLOGY n 7 positive

1 - 2 ARTHROSCOPIES  
ANTITUBERCULAR CHEMOTHERAPY

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Prevalence of septic arthritis after anterior  
cruciate ligament reconstruction among  
professional athletes.  
SONNERY-COTTET B et al. 2012 Am J Sports Med.

LEVEL III n1957 ACL - RECONSTRUCTION  
n 88 PROFESSIONAL ATHLETES

0,37% INFECTION - NON PROFESSIONAL GROUP  
5,7% INFECTION - PROFESSIONAL GROUP

SIGNIFICANT CORRELATION  
BEING PROFESSIONAL ATHLETE  
HAVING COMBINED TENODESIS + ACL

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**CONCLUSIO**

KLINISCHER BEFUND !!!!!!!

LABOR  
BSG -CRP -BSG - INTERLEUKIN  
(VERLAUFSKONTROLLE )

PUNKTION (ZELLZAHL - BAKTERIOLOGIE )

ARTHROSKOPIE (LAVAGE + BIOPSIE )

MRI - CT bei SPÄT (CHRONISCHEM) INFEKT

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VIELEN DANK

• WENN der CHIRURG bei der

UNTERSUCHUNG denkt

Es könnte ein INFEKT sein

**DANN ist es EIN INFEKT**

H. HÄFELE AS-KURSE 1986

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