

# **Metabolic changes in Knee joint Synovial membrane during reperfusion after Arthroscopy**

## **A micro dialysis study**

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# Background

- **The Synovial membrane function is important for Joint Physiology**
- **In Sweden approximately 40.000 arthroscopies are performed annually**
- **The irrigation fluid distends the joint and reduces the synovial circulation**

# Purpose

- **To study the synovial physiology using the microdialysis technique in a trauma model using knee arthroscopy**

# Microdialysis

- **A technique to study local tissue metabolism.**
- **A thin catheter works as an artificial blood vessel**
- **Dialysis fluid is propagated to the tip of the probe, which is surrounded by a porous membrane (cut off 20 kD).**
- **At the tip the fluid turns back and is collected in a vial at the base of the catheter**

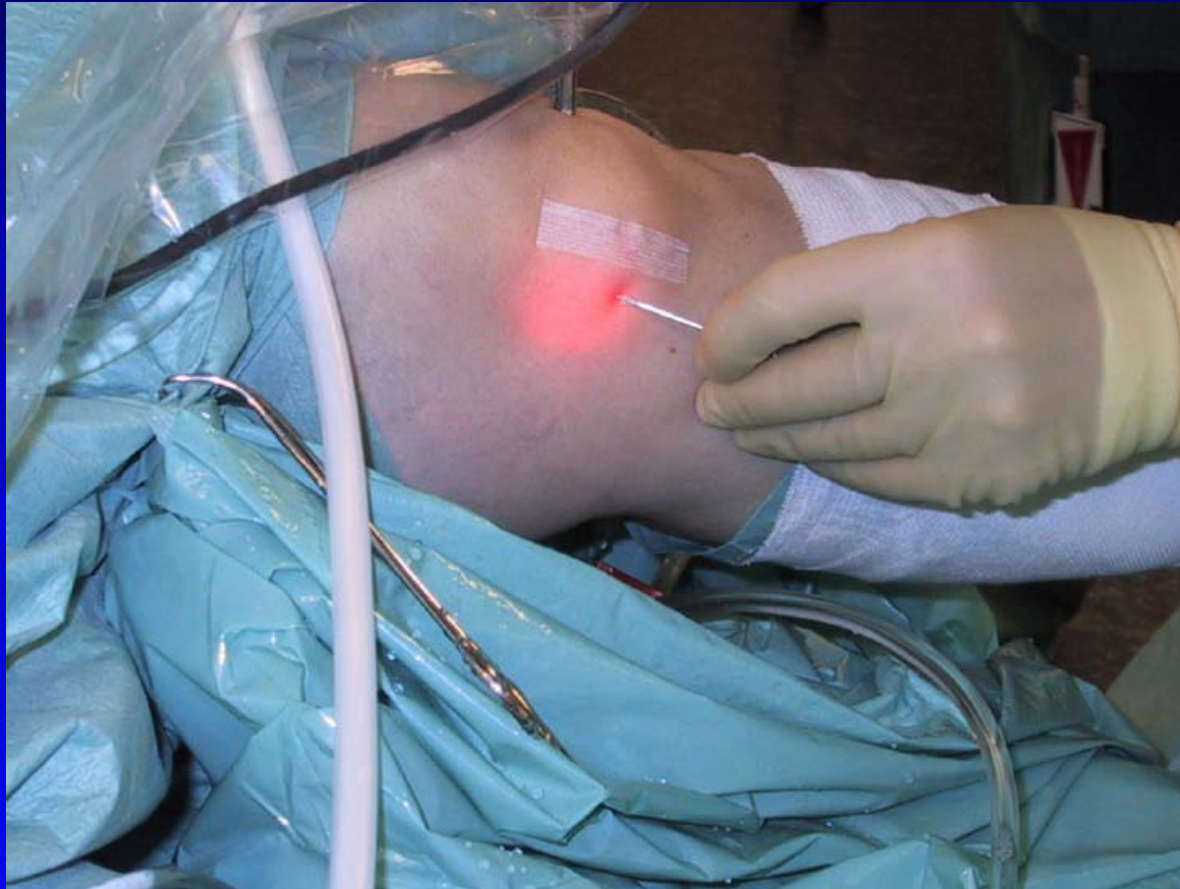
# Material and Methods

- **13 patients who underwent arthroscopy**
- **2 probes (CMA 60 with porous size of 20 kD):**
- **1 reference probe in the subcutaneous fat of the contra lateral thigh**
- **1 probe in the medial synovial membrane placed under arthroscopical control at the end of the operation**
- **CMA 107 microdialysis Pump**
- **Blood samples**

# Material and Methods

- **Fraction sampling every 20 min. for 3 hrs postoperatively, after 40 minutes of equilibration**
- **In 7 patients dialysis rate was 0,3 micro liters/min**
- **In 6 patients blood flow with ethanol was analysed at a rate of 2,0 micro liters/min**

# Application of the probe under arthroscopic control



# The Synovial probe and Dialysis Pump in place

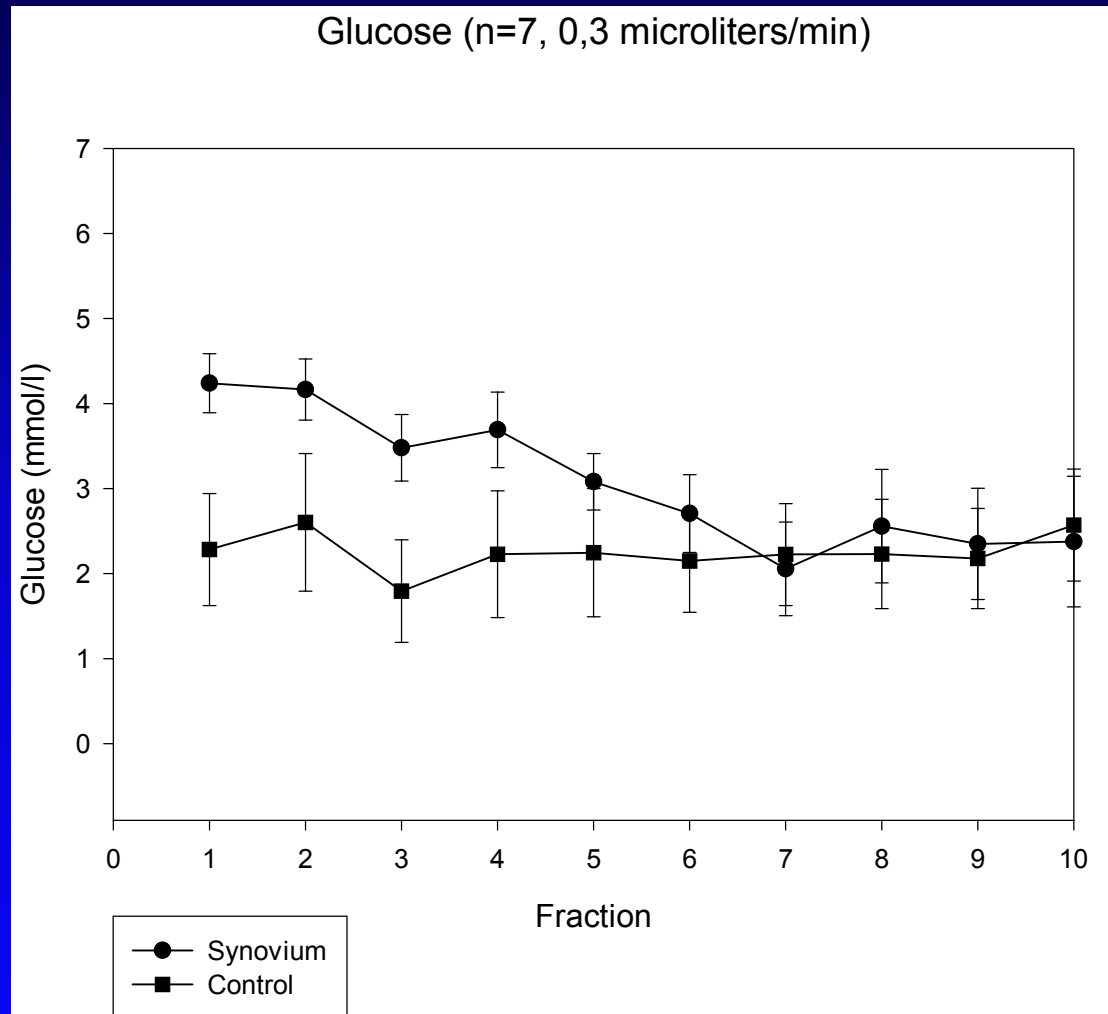




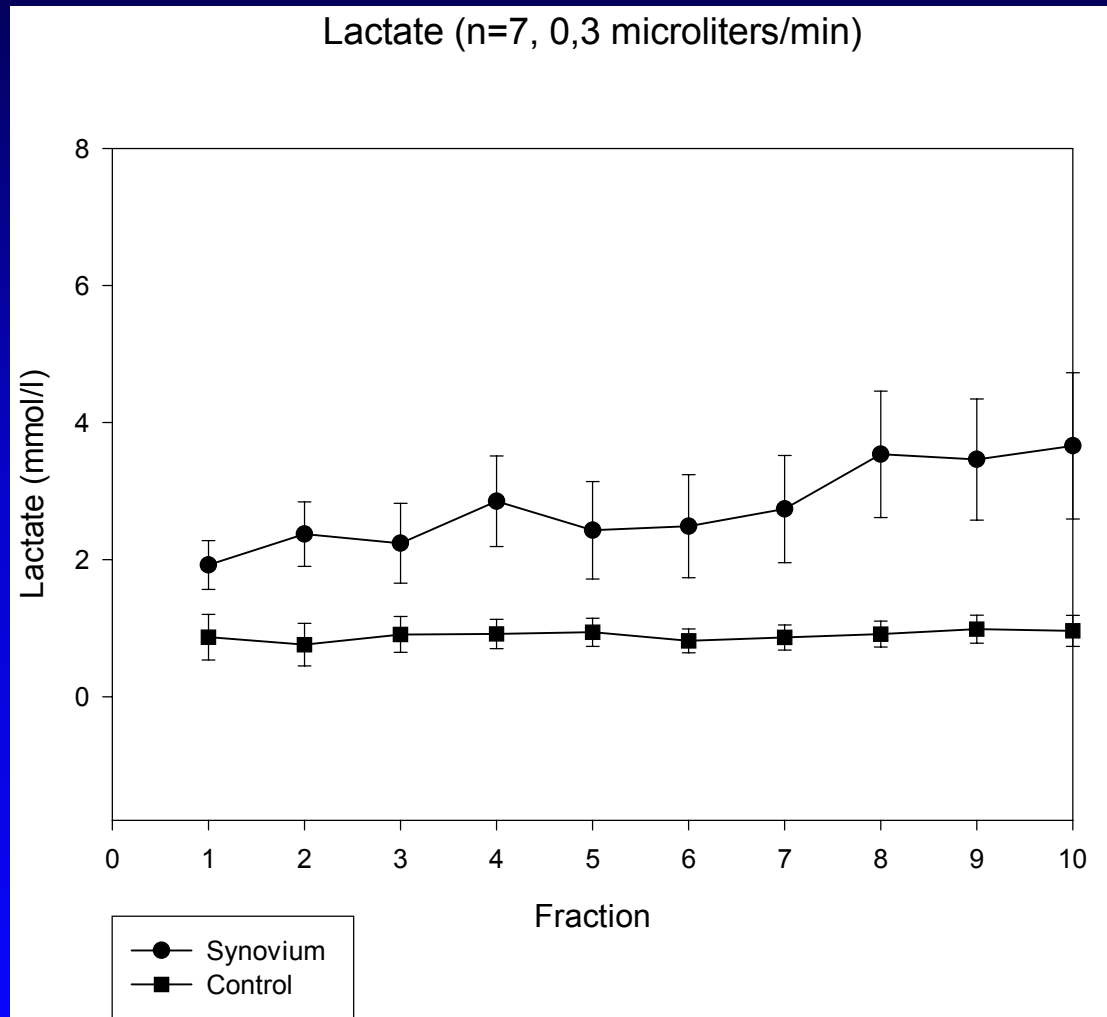
# Material and Methods

- **Analysis of glucose, lactate, pyruvate, glycerol and ethanol quotient to quantitative changes in blood flow**
- **ANOVA ( $p < 0.05$ )**

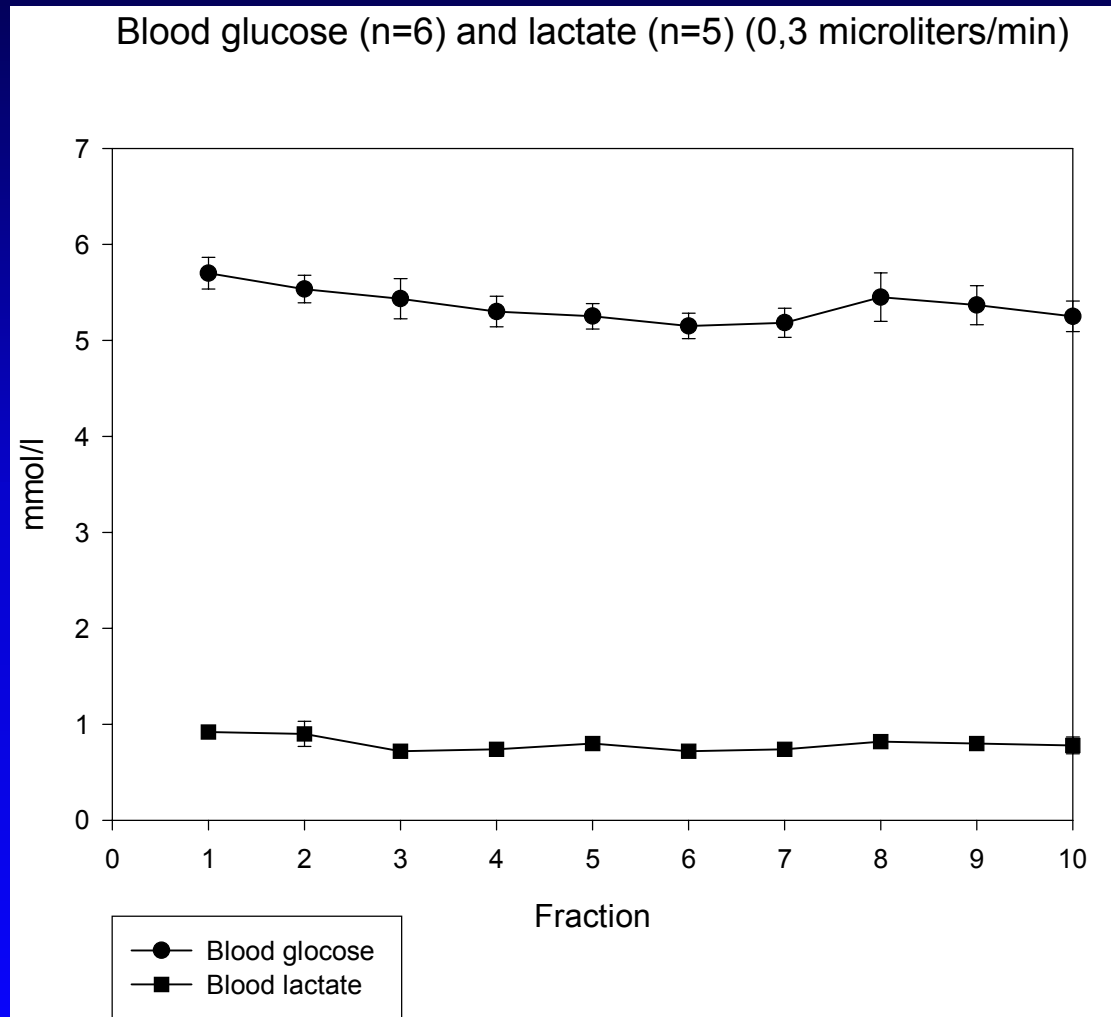
# Results (glucose)



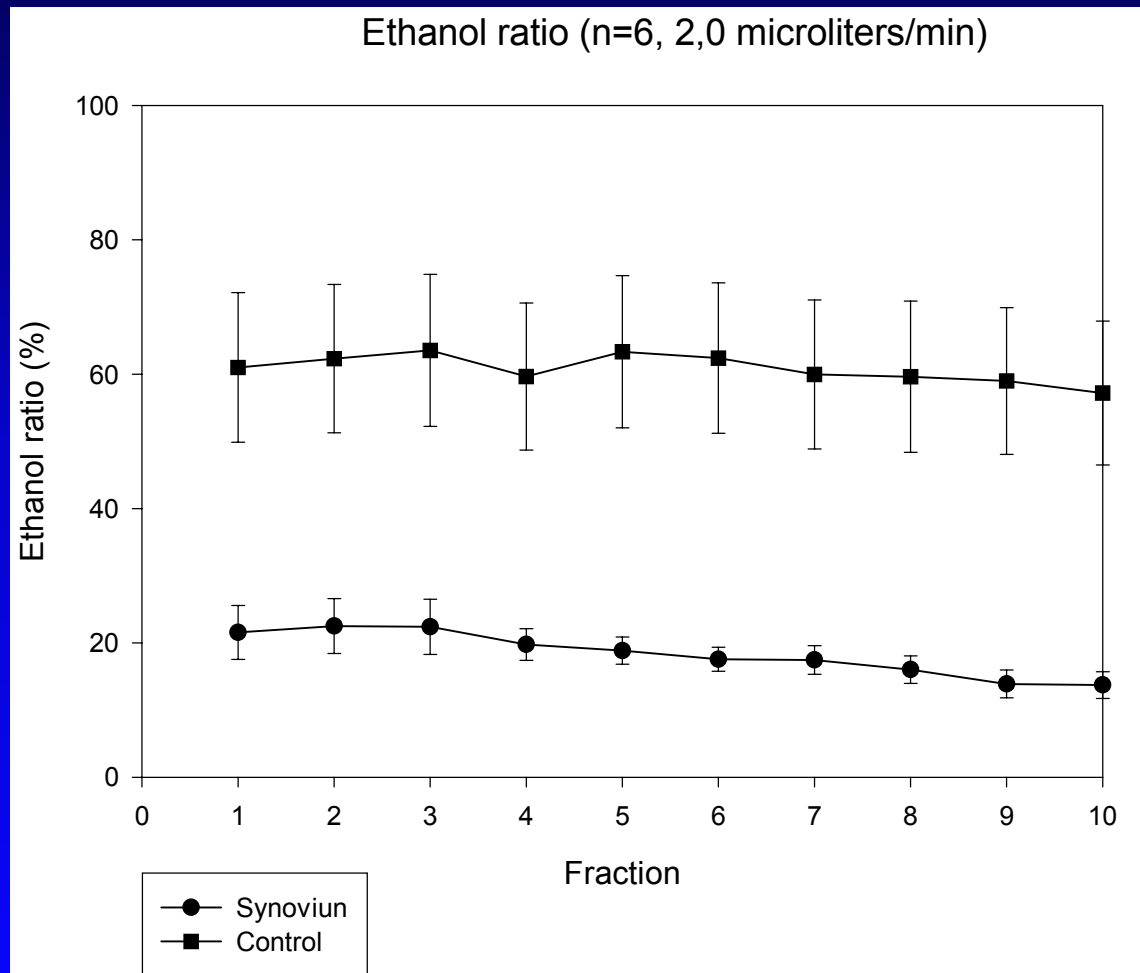
# Results(lactate)



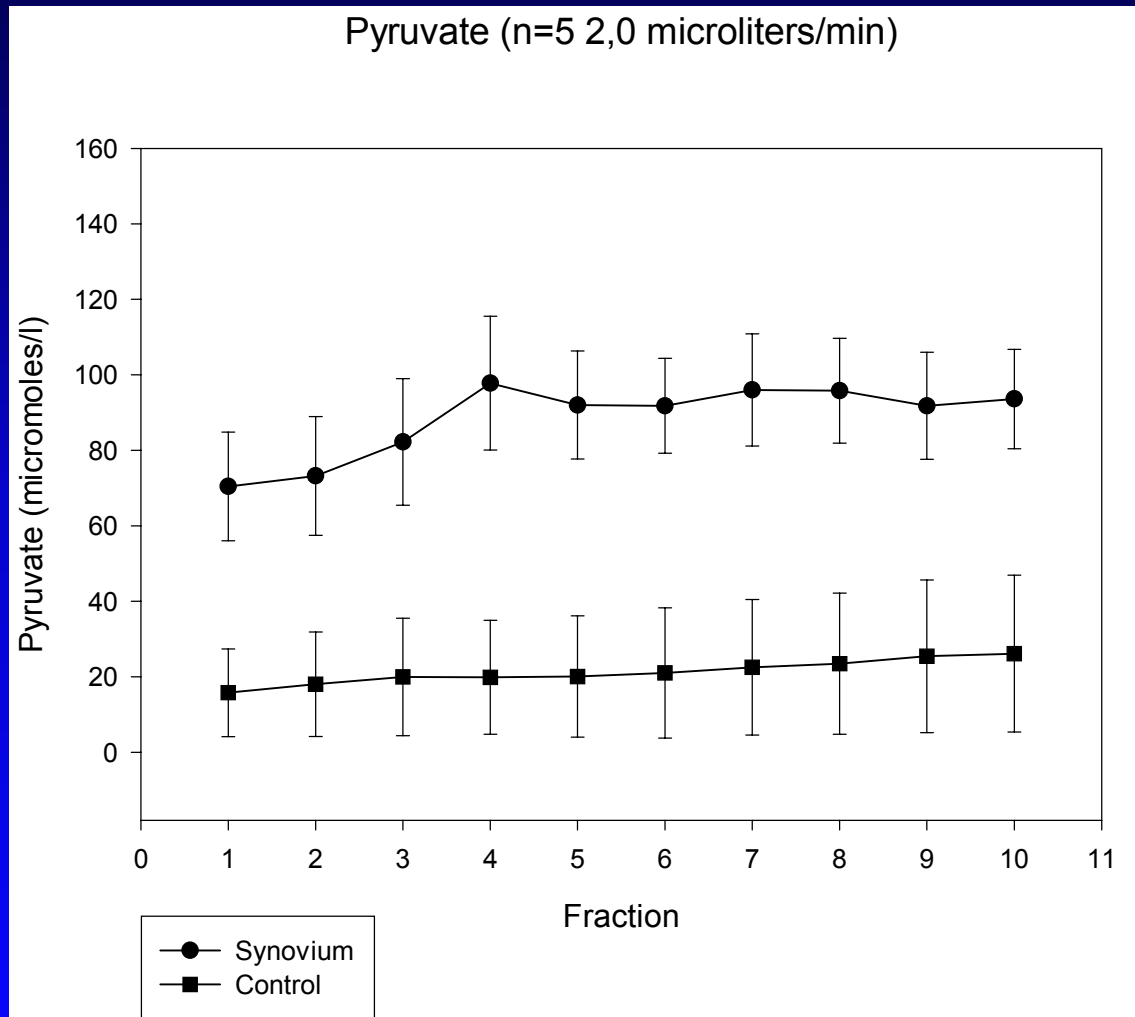
# Results (b-glucose, p-lactate)



# Results blood flow (ethanol quotient)



# Results (pyruvate)



# Results glycerol

- **No significant changes neither in the synovial nor in reference tissue**

# Discussion

- **A state of reperfusion with hyper metabolism**
  - **Glucose consumption**
  - **Lactate and pyruvate production**
- **Stable levels in the general circulation**
- **Stable Ethanol quotient**

# Conclusion

- **The synovial membrane is affected by a reperfusion syndrome even after such a mild trauma as arthroscopy**
- **Microdialysis technique could be useful measuring local tissue metabolism in the knee joint area**



*Thank you*

