

# The Frequency and Severity of Complications in Surgical Treatment of Osteochondral Lesions of the Talus

## A Systematic Review and Meta-Analysis of 6,692 Lesions

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# Background

Osteochondral lesions of the talus (OLTs) are lesions that affect the articular cartilage and the subchondral bone. Often, this arises after a traumatic event, such as an ankle sprain or fracture.

Complication characteristics are an important factor in the evidence-based shared decision-making process. Besides complications, the efficacy and costs of a treatment are also of importance.

Recent research has shown that no superior treatment for primary and secondary lesions exists. Increased insight into the occurrence, severity, and types of complications in surgical treatment of OLTs is therefore of importance in future patients' treatment decisions.

# Aim

Therefore, the primary aim of this study is to determine and compare the complication rate per surgical treatment option for OLTs.

The secondary aim is to analyze and compare the severity of complications and to analyze the types of complications per treatment option.

# Materials and Methods

Studies from 1996 until September 2021 in MEDLINE (PubMed), EMBASE (Ovid), and the Cochrane Library.

Methodological quality was assessed using the Methodological Index for Non-Randomized Studies (MINORS).

## Primary outcome

Complication rate (proportion of complications to the total number of lesions)

## Secondary outcomes

Severity of the complications (Modified Clavien-Dindo-Sink Complication Classification System for Orthopedic Surgery)<sup>1</sup>.

Types of complications

# Definition a 'complication'

*“Any undesirable, unintended, and direct result of an operation affecting the patient”*

The present study used the following definition of a complication, adopted from Sokol and Wilson<sup>2</sup>.

For example, graft non-union or other graft-related failures, was excluded from the analysis. In addition, secondary surgical procedures and hardware removal were also not scored as a complication.

# Treatment groups

Treatment Option	Examples
Bone marrow stimulation therapies	Bone marrow stimulation, debridement, microfracture
Retrograde drilling	Retrograde drilling
Fixation	Lift, drill, fill, fix
Matrix-assisted bone marrow stimulation	Autologous chondrocyte inducing chondrogenesis, matrix-associated stem cell transplantation, autologous matrix-induced chondrogenesis, bone marrow-derived stem cell transplantation
Cartilage implantation	Autologous chondrocyte implantation, matrix-induced autologous chondrocyte implantation, particulated juvenile cartilage allograft transplantation
Osteo(chondral) autograft transplantation therapies	Osteochondral autograft transfer system, autologous osteochondral transplantation
Osteo(chondral) allograft transplantation therapies	Allogenic osteochondral transplantation
Metal implants	Implant therapies

# Results

## Article selection and methodological quality

### Article selection

3,949 studies identified

178 studies included in analysis

6,921 patients with 6,692 lesions

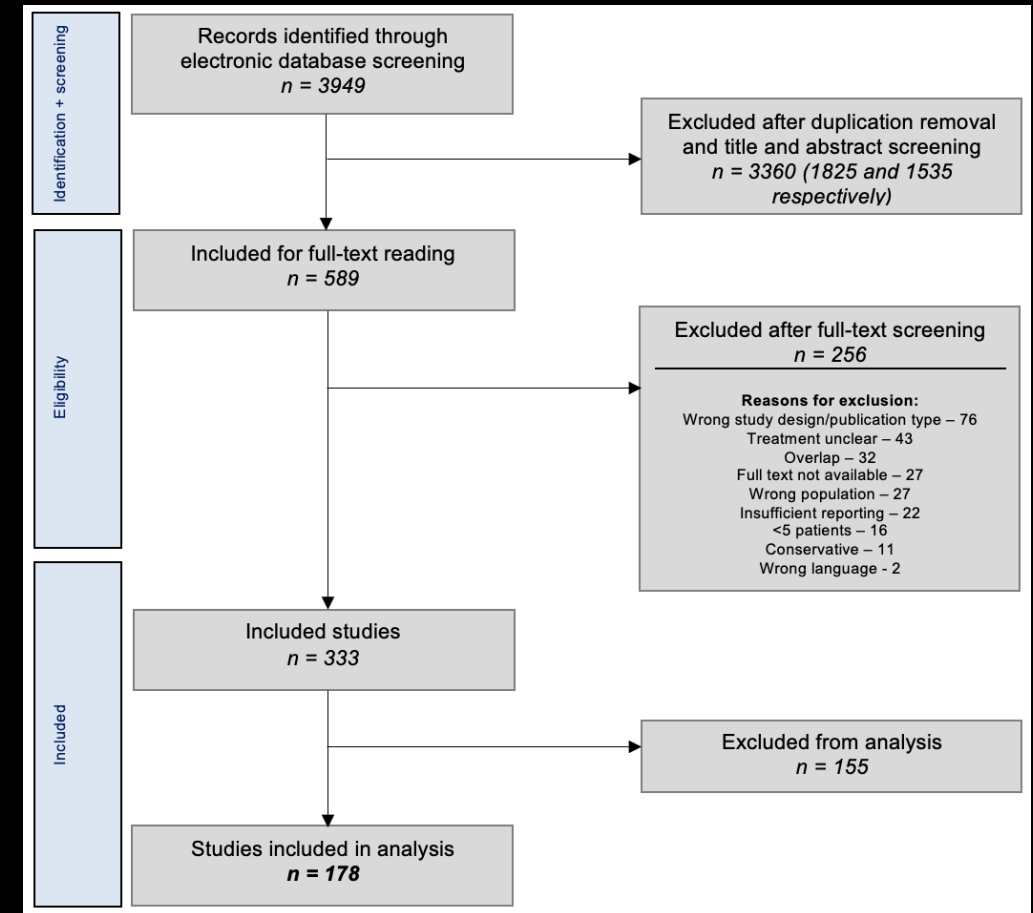
Mean age 35.5 years

Mean follow-up 46.3 months

### Methodological quality

Non-comparative: 10.1 out of 16

Comparative: 17.8 out of 24





# Results

## *Primary outcome*

225 complications reported

Overall complication rate 5% (95% CI: 4%-6%)

Treatment Option	Studies n	Lesions n	Complication Rate % (95% CI)
Overall	178	6,962	5 (4-6)
Bone marrow stimulation therapies	67	2,926	4 (3-6)
Retrograde drilling	14	289	5 (3-8)
Fixation	8	179	3 (1-8)
Matrix-assisted bone marrow stimulation	31	1,072	3 (2-4)
Cartilage implantation	22	479	5 (3-8)
Osteo(chondral) autograft transplantation therapies	61	1,639	8 (6-10)
Osteo(chondral) allograft transplantation therapies	15	288	8 (4-14)
Metal implants	3	80	15 (5-35)
Other	1	10	5 (0-45)

# Results

## *Secondary outcomes*

No Grade IV and Grade V complications were found.

In 5 treatment modalities (i.e., BMS therapies, retrograde drilling, fixation, cartilage implantation, and metal implants), nerve injury, either temporary or duration unknown, was the most frequently reported complication.

# Discussion

## Main finding

5% risk of a complication with surgical treatment of an OLT.

## Methodological considerations

Fair methodological quality

Sub-analysis primary versus non-primary not possible due to heterogeneity

Search from 1996

Authors were not contacted for additional information

137 studies excluded due to no (clear) reporting

Most studies retrospective nature

Possible selection, detection and recall bias

# Conclusion

In 1 out of 20 patients treated surgically for an OLT, a complication occurs.

# References

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2. Sokol DK, Wilson J. What is a surgical complication? World J Surg. 2008 Jun;32(6):942-4.