

# The Arthroscopic Minced Cartilage Technique for the Treatment of Cartilage Defects in the Knee Joint - Is There a Perfect Patient?

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## Purpose

The treatment of cartilage has continuously evolved since 1980. In addition to microfracturing, the most common techniques include autologous chondrocyte implantation, scaffold-based techniques, fresh and particulate allografts, alternative cell and tissue sources, novel cell-free biomaterials, and scaffold-free approaches. The arthroscopic cartilage mincing technique is part of the "fresh and particulate allografts". This technique is an open procedure for the one-stage autologous transplantation of cartilage chips, which are fixed with fibrin glue (blood coagulation through the action of thrombin and PRP (Platelet Rich Plasma)). Initial studies showed positive results in the short term of up to 6 months. The aim of this study is now to find out whether there are patients who respond best to this surgical procedure and what characterizes these patients.

## Methods and Material

In this study, 100 patients were analyzed in closer detail and the results were evaluated after 6 months based on 5 criteria. The parameters used for the analysis were BMI, age, gender, smoker, and insurance type. These 5 criteria were compared using linear multivariate regression and tested for comparability. 75 patients participated in a survey of our Patient-Related Outcome Measure System (PROMs) for the first 6 months. The following 5 scores were recorded for this period: VAS, KOOS and the subclass KOOS ADL, SANE and Tegner.

## Results

In the first 6 months, all 75 patients improved significantly in the KOOS, KOOS ADL and VAS scores. In the comparison between smokers (22) and non-smokers (78), there were no differences in all scores 6 months after the intervention. BMI was classified according to WHO criteria (<18.5/18.5-24.9/25.0-29.9/30.0-34.9/35.0-39.9/>40) and showed no difference between groups after 6 months. Age was categorized into 4 years of life (<29/30-39/40-49/>50) where it can also be seen that there is no difference between the groups after 6 months. For gender (54 males / 46 females) there were also no significant differences between the sexes in all scores. The comparison between the two types of insurance in Germany (77 public and 23 private) was also interesting. The medians after 6 months are almost identical in the individual scores.

## Discussion

When analyzing the parameters age, gender, BMI, insurance status and smoker/non-smoker after 6 months, it can be observed clearly that there is no linear relationship between function, pain level and sport activity to the individual parameters. However, trend sharpening can be shown such as the age group between 40-49 in KOOS. The product/procedure shows good to very good results 6 months post-operatively independent of age, gender, BMI, insurance status and smoking behavior.

Considering the small number of cases in each group and the time of analysis (6 months post-operatively), these data should be interpreted with caution.

## Conclusion

According to our analysis, all patients were suitable for autologous minced cartilage joint repair and presented significant improvements in all clinical scores without any differences in the selected subgroups. It is recommended to re-evaluate this analysis after 12 and 24 months and to increase the number of cases.

## Conflict of Interest

There are no conflicts of interest.

## Authors

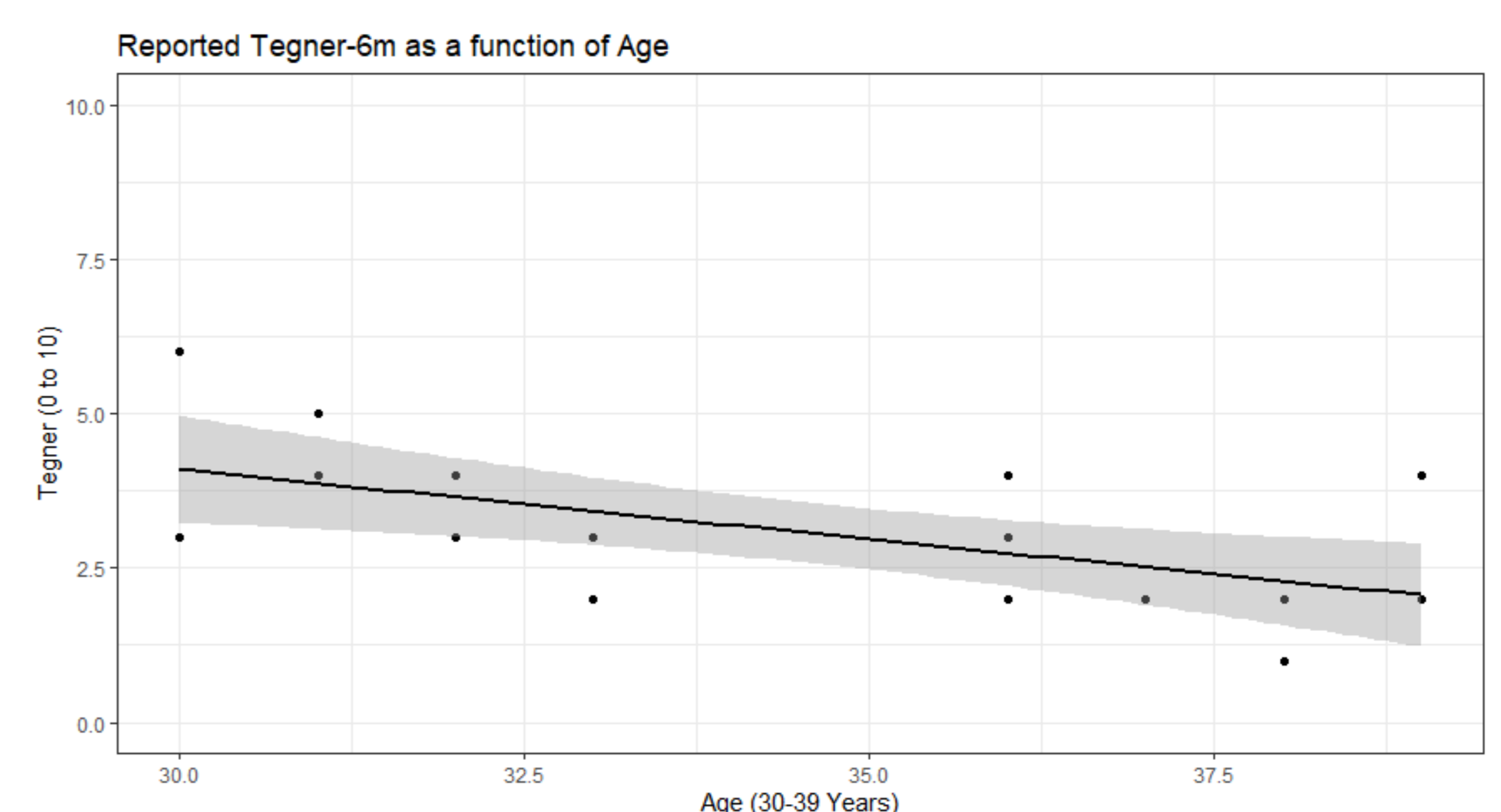
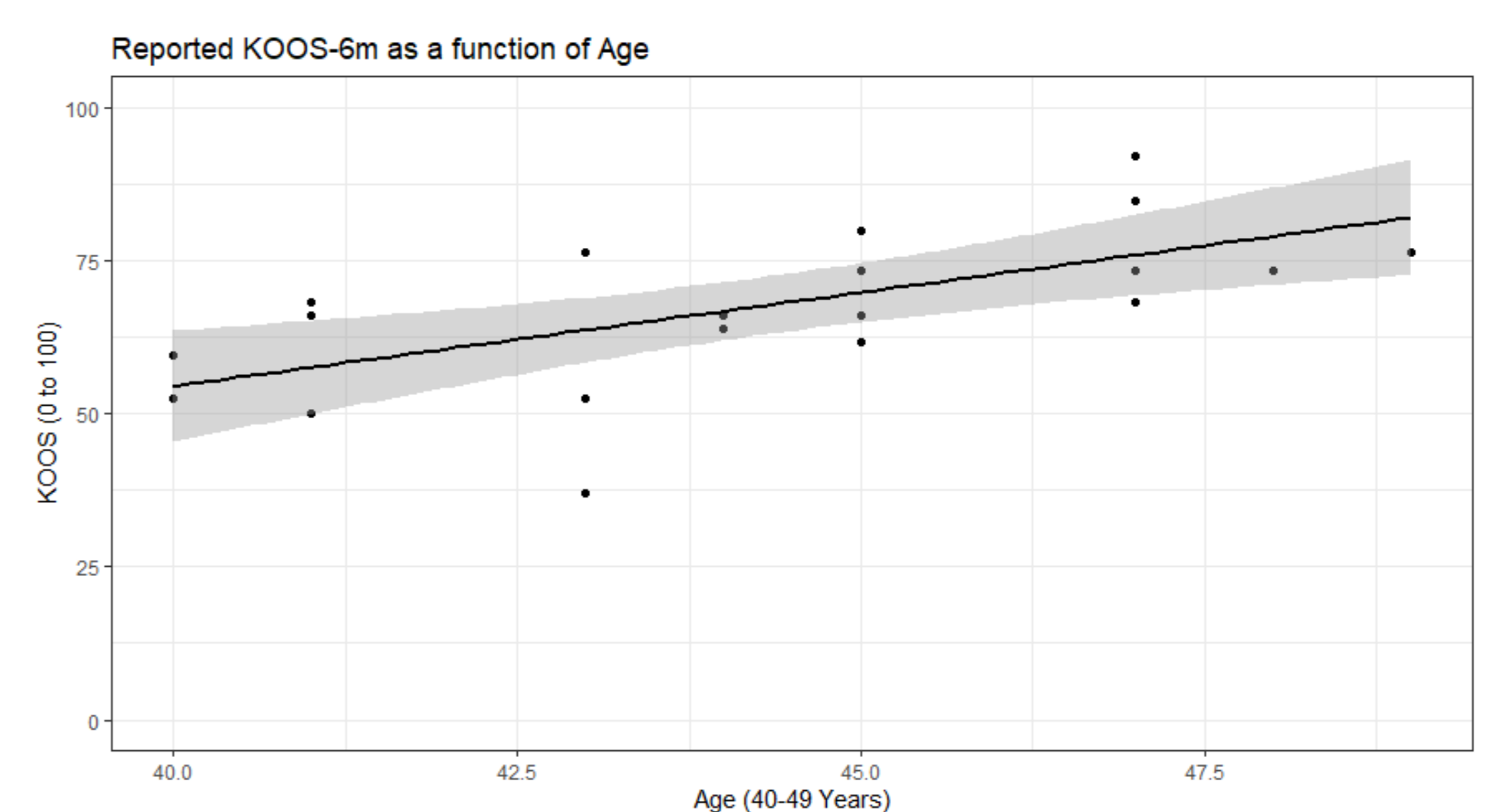
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## Figures & Tables

Gruppe	VAS*	KOOS*	Tegner*
Age <=29	0.03088	-0.0555	-0.02117
Age 30-39	-0.05875	0.1251	<b>0.3202</b>
Age 40-49	-0.01006	<b>0.3774</b>	0.01585
Age 50-59	0.1297	-0.00799	0.2748
Age >60	NA	NA	NA
BMI <=25	-0.01197	0.1441	-0.03431
BMI 25-30	-0.1245	-0.11	0.2742
BMI 31-35	-0.1388	0.1003	<b>-0.4546</b>
BMI 35-40	NA	NA	NA
Smoker**	<b>0.5162</b>	0.2027	0.0929
Non smoker**	-0.01682	0.03306	0.04055
Male**	-0.008448	0.002484	0.02079
Female**	-0.02892	0.1253	0.03515
SHI**	-0.01289	0.05659	0.06782
PHI**	0.09407	0.3996	-0.01397

\*Adjusted R-squared (R<sup>2</sup>)

\*\* Considering the age



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