

# Osteochondrosis (OCD) in the tarsocrural joint of Standardbred trotters – Correlation between radiographic findings and racing performance

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## Summary

The tarsocrural joints of 1190 Standardbred trotters were examined radiographically between 1969 and 1986 in the Clinic for Horses, General Surgery and Radiology of the Free University of Berlin as part of a prospective radiological study of the tarsus. Of these, 147 (12.4%) showed signs of osteochondrosis dissecans (OCD).

The horses did not have surgery for OCD by arthrotomy or arthroscopy.

The racing performance of the horses positive for OCD and negative for OCD was compared. Parameters compared were the number of starts, the number of wins, the number of places, the earnings and the maximum speed ever reached. These parameters were compared in the two-year-olds, the three-year-olds, the four-year-olds and lifetime performance.

No significant differences in racing performance parameters were found between horses with and without radiographic findings of OCD.

**Keywords:** OCD, tarsocrural joint, racing performance, longevity, joint, Standardbred trotter

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## OCD im Tarsokruralgelenk von Trabern Vergleich röntgenologischer Befunde mit der Rennleistung

Von 1190 während der Jahre 1969 bis 1986 in der Klinik für Pferde, Allgemeine Chirurgie und Radiologie der Freien Universität Berlin im Rahmen einer prospektiven Studie röntgenologisch an den Sprunggelenken untersuchten Trabern wiesen 147, d.h. 12,4%, Röntgenbefunde im Sinne einer Osteochondrosis dissecans (OCD) auf.

Die Pferde wurden trotz des Befundes im Untersuchungszeitraum nicht arthrotomisch oder arthroskopisch versorgt.

Die Rennlaufbahn der OCD-positiven Traber und der OCD-negativen Traber wurden miteinander verglichen. Als Parameter dienten die Anzahl der Starts, die Anzahl der Siege, die Anzahl der Plätze, die Gewinnsumme und der Kilometerrekord. Die entsprechenden Daten der Pferde als Zweijährige, Dreijährige, Vierjährige und die Lebensrennleistung wurden als Vergleichsklassen berechnet.

Die Rennleistungsdaten der OCD-positiven und der OCD-negativen Traber unterscheiden sich in keiner der Altersklassen und in keinem der Parameter signifikant.

**Schlüsselwörter:** OCD, Tarsokruralgelenk, Rennleistung, Lebensleistung, Gelenk, Trabrennpferd

## Introduction

Although profound knowledge has been worked out about diagnosis of osteochondrosis of the tarsocrural joint, epidemiology, pathogenesis, therapy and hereditary factors, very few details exist about the relation of the findings and racing performance. The interpretation of the radiological signs of osteochondrosis in the tarsocrural joint remains an important factor in purchase examinations of young horses without clinical symptoms.

Zeller *et al.* (1978) showed in a retrospective study that 30% of the horses were positive for OCD of the tarsocrural joints without showing clinical symptoms. Sandgren *et al.* (1993) pointed out that in contrast with OCD of the fetlock joint, OCD of the tarsocrural joint can lead to clinical signs and may have an impact on the future racing career of these horses. According to Grondahl *et al.* (1995) OCD in the tarsocrural joint leads to significantly lower number of starts and insignificantly lower earnings in three-year- and four-year-old Standardbreds. On the other hand, Storgard Jorgensen *et al.* (1997) did not find any significant association between the presence or type of ra-

diological abnormalities and performance during two to four racing seasons.

The aim of this study was to show whether the presence of OCD-lesions in the tarsocrural joint can alter lifetime racing performance in a group of Standardbreds with OCD of the tarsocrural joint not having surgery for this condition.

## Materials and methods

1190 Standardbred trotters were examined radiographically for alterations of the tarsus. Both tarsi were radiographed in lateral, dorsolateral-plantaromedial and plantarolateral-dorsomedial views. OCD alterations of the sagittal ridge of the tibia and of the lateral trochlear ridge of the talus were found, while there were no lesions of the medial maleolus mentioned in the clinical files. Horses showing these alterations were included in the OCD-positive group. The radiographs were taken for a prospective study conducted to evaluate the development of

bone spavin in racing Standardbreds. OCD lesions were not the focus of the study, and OCD of the tarsocrural joint was not treated surgically at this time.

The study included any racing Standardbred which was presented at the clinic regardless the reason of its referral. The clinical signs were documented at the time of the radiological examination and, for this study, taken from the clinical documents.

The age of the first radiological examination of the horses varied between 1,5 and 12 years.

Data about racing performance were taken from the statistical publications of the German Standardbred Association. The following parameters were correlated during the racing career as two-, three- and four-year-olds:

- { number of starts
- { number of wins
- { earnings

Lifetime performance is defined as the summation of each above mentioned parameter: Sum of starts, sum of wins, sum of places and sum of earnings of each individual horse during his racing career, and its maximum speed ever reached.

Statistical analysis was provided by the Institute of Biometrical Studies of the Faculty of Veterinary Medicine of the Free University of Berlin. Nonparametrical testing (Mann-Whitnes U and Wicoxon W) using the SAS® statistical package. All horses positive for OCD in the tarsocrural joint except for three horses that could not be identified (n=144) were compared with a group of horses (n=118) randomly selected from the 1043 horses negative for OCD.

**Results**

OCD in the tarsocrural joint was observed in 147 (12.4%) of 1190 Standardbred trotters. Of the 147 affected horses, 75 (50.8%) had a unilateral OCD of the sagittal ridge of the tibia. Fifty-eight of the affected horses (39.5%) showed bilateral OCD of the sagittal ridge. Fourteen of the horses (9.7%) had a diagnosis of unilateral OCD of the lateral trochlea of the talus (table 1).

**Tab. 1:** Distribution of radiological findings of OCD of the tarsocrural joint (TCJ).

*Verteilung der radiologischen Befunde von OCD des Tarsokruralgenkes*

Location of OCD	Number of horses	% of horses	% of OCD
No OCD	1043	87,6	0,0
Sagittal ridge left TCJ	47	3,9	31,4
Sagittal ridge right TCJ	28	2,4	19,4
Sagittal ridge bilaterally	58	4,9	39,5
Lateral trochlea tali left TCJ	9	0,8	6,5
Lateral trochlea tali rightTCJ	5	0,4	3,2
∑	1190	100	100

Clinical signs reported were lameness, effusion of the tarsocrural joint and positive flexion tests of the proximal joints of the hindlimb. As the horses examined for this investigation were sent to the equine hospital for various reasons, correlations between the clinical signs and OCD could not be demonstrated. Problems leading to the respective signs also were deriving from structures not related to the tarsocrural joint. As examples, wounds, bursitis, tendonitis and splint bone fracture were among the diagnoses. Interestingly, unilateral OCD of the tarsocrural joint was associated with contralateral affection of the m. interosseus medius in some of the cases.

In tables 2, 3, 4, 5 and 6 the number of starts, wins, places, earnings and maximum speed of horses with and without OCD

**Tab. 2:** Number of starts of horses with and without radiological findings of OCD

*Anzahl Starts der Pferde mit und ohne radiologische Anzeichen für OCD*

Age	OCD	Number of horses	Mean	STD	Min	Max
Two-year	Control	118	1	2	0	7
	OCD	144	1	2	0	9
Three-year	Control	118	5	6	0	25
	OCD	144	5	6	0	25
Four-year	Control	118	9	9	0	36
	OCD	144	9	9	0	37
Lifetime performance	Control	118	51	50	0	239
	OCD	144	55	50	0	273

**Tab. 3:** Number of wins of horses with and without radiological findings of OCD.

*Anzahl Siege der Pferde mit und ohne radiologische Anzeichen für OCD*

Age	OCD	Number of horses	Mean	STD	Min	Max
Two-year	Control	118	0	0	0	2
	OCD	144	0	0	0	2
Three-year	Control	118	1	1	0	7
	OCD	144	1	2	0	12
Four-year	Control	118	2	2	0	9
	OCD	144	2	3	0	17
Lifetime performance	Control	118	6	8	0	35
	OCD	144	8	11	0	60

during their racing career are listed. No statistically significant difference between horses with and without OCD of the tarsocrural joint in any of the parameters was found. Mean values were close together and standard-deviations partially exceeded mean values.

**Tab. 4:** Number of places of horses with and without radiological findings of OCD

Anzahl Platzierungen von Pferden mit und ohne radiologische Anzeichen für OCD

Age	OCD	Number of horses	Mean	STD	Min	Max
Two-year	Control	118	0	1	0	5
	OCD	144	1	1	0	6
Three-year	Control	118	2	3	0	15
	OCD	144	2	3	0	12
Four-year	Control	118	4	4	0	16
	OCD	144	4	5	0	23
Lifetime performance	Control	118	20	22	0	133
	OCD	144	22	24	0	121

**Tab. 5.:** Earnings (DM) of horses with and without radiological findings of OCD

Gewinnsumme (DM) von Pferden mit und ohne radiologische Anzeichen für OCD

Age	OCD	Number of horses	Mean	STD	Min	Max
Two-year	Control	118	1634	5588	0	40680
	OCD	144	1840	7059	0	67069
Three-year	Control	118	3204	11634	0	121910
	OCD	144	5065	11899	0	104123
Four-year	Control	118	6288	8117	0	32100
	OCD	144	7599	13179	0	92500
Lifetime performance	Control	118	30304	42474	0	215300
	OCD	144	40504	64221	0	428500

## Discussion

The percentage of OCD in the tarsocrural joints of Standardbred trotters is comparable to percentages found by other investigators looking at a similarly high number of horses. *Grondahl* (1991) found 14,3% of OCD in a group of 753 Standardbreds, 45,4% of those showing bilateral problems. *Sandgren et*

*al.* (1993) reported 11,5% of OCD in the tarsocrural joint in 793 standardbreds with 45% bilateral signs, 5% at the lateral trochlea tali. The distribution among the limbs in our study also reflects the situation described in the literature.

**Tab. 6:** Lifetime maximum speed (seconds over one minute per kilometer) achieved of horses with and without radiological findings of OCD

Maximal erzielte Geschwindigkeit (beste, je gelaufene Zeit des einzelnen Pferdes) in Sekunden über 1 Minute bei Pferden mit und ohne radiologische Anzeichen für OCD

Age	OCD	Number of horses	Mean	STD	Min	Max
Lifetime performance	Control	106	22,38	3,87	14,6	34,9
	OCD	144	22,46	4,43	14,4	43,2

The clinical evaluation shows that OCD in the tarsocrural joint is not necessarily causing clinical signs. This also is in agreement with other authors (*Zeller et al., 1978; Peremans and Verschooten, 1997*).

The comparison of the racing performance of horses affected with OCD of the tarsocrural joint but not treated surgically with horses not affected with this condition showed no significant differences in the parameters „number of starts“, „number of wins“, „number of places“, „earnings“ or „maximum speed“. This is in accordance with the results of *Alvarado et al. (1990)* and *Storgard-Jorgensen et al. (1997)* for the two-year-olds, the three-year-olds and the four-year-olds, but in contradiction to *Grondahl and Engeland (1995)*, where a negative effect of OCD in the tarsocrural joint on the racing performance was postulated. This negative effect, however, was significant only for the number of starts, while the tendency to lower earnings was not significant. As these horses were examined as yearlings already, the awareness of the trainers may have led to fewer starts and earnings. The material of our originally prospective, study, however, was only evaluated retrospectively, and the radiological signs of OCD in the tarsocrural joint were not judged to be of high clinical importance at the time of the examination.

For the first time results of lifetime racing performance data are here reported. According to our results for the young horses, no significant differences in the lifetime racing performance were observed when comparing the above mentioned parameters. In the clinical situation, young standardbreds are radiographed for purchase examination, and the presence of OCD signs in the tarsocrural joints will always raise the question for the significance for the future of the individual. Our data support the finding that there is no general indication for preventative surgery when we look at the overall population. Most of the horses showing signs of OCD in the tarsocrural joint would race without developing clinical problems at this site.

Therefore, we deal with the problem according to the proposal of *Zeller et al. (1978)*. Horses with joint effusion and/or lameness from the tarsocrural joint and/or positive flexion tests of the respective joint are candidates for arthroscopic surgery. This is supported by *Peremans and Verschooten (1997)* who recommend surgery for Standardbreds when presented with clinical

symptoms associated with radiologic signs of hock OCD. The surgical procedure is safe (Laws *et al.*, 1993; Bramlage *et al.*, 1994), and not performing surgery could result in greater expense (spent training fees etc.) than early surgery. Horses without one of the clinical signs, however, can be trained without preventative surgery and the risk of problems in the OCD-affected joint is low.

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