

Radiographic Lucencies in the Medial Femoral Condyle of Thoroughbred Sale Yearlings: A Preliminary Investigation of the Effect on Race Records

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Radiographic lucencies in the medial femoral condyle of Thoroughbred sale yearlings reduce the likelihood a horse will sell at auction and the price paid compared with unaffected horses in the same sale; however, no difference in racing results was found between affected and unaffected horses. Authors' addresses: Equine Medical Associates, 996 Nandino Boulevard, Lexington, KY 40511 (Whitman, Morehead, Prichard, Hance); and the University of Wisconsin, School of Veterinary Medicine, 2015 Linden Drive, Madison, WI 53706 (Keuler, Santschi); e-mail: whitmandvm@yahoo.com (Whitman). © 2006 AAEP.

1. Introduction

Survey radiographs are often taken of Thoroughbred yearlings sold at public auction. For some sales, sets of radiographs of specific views of specific joints are available for inspection by potential buyers or their agents, and interpretation of the radiographic findings is one factor in the decision to purchase. There have been studies addressing the significance of radiographic abnormalities on future racing careers,¹⁻³ but none have addressed medial femoral condylar (MFC) lucencies, which are occasionally seen on survey radiographs. The appearance of the lucency can vary. Subchondral lucencies (SCL) at the distal aspect of the MFC are shallow; they have a greater width (lat-

eral-medial) than height (proximal-distal) and are crescent shaped (Fig. 1). MFC cysts are rounded lucencies within the condyle that usually seem to communicate with the medial femoro-tibial joint (Fig. 2).

The significance of MFC lucencies in clinically unaffected horses is unknown. Although some subchondral bone cysts are always clinically silent,⁴ some cause lameness and limit performance. Accurately predicting the impact of a MFC radiographic lucency in a yearling on later racing performance is presently hampered by a lack of performance information from affected horses. The purpose of this paper is to describe the radiographic features of the MFC in horses with lucencies and to compare their

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Fig. 1. Radiographic subchondral lucency in medial femoral condyle.

racing records with those of unaffected yearlings sold at the same time.

2. Materials and Methods

The descriptions of stifle joints (lateral-medial and either caudo-cranial or 20° caudo-cranial lateral-medial oblique views) from 2915 reports of repository radiographs from Thoroughbred yearling sales in September of 1998–2003 were searched^a using the keywords cyst and lucency. All radiographic descriptions were written by three experienced equine veterinarians (Morehead, Prichard, and Hance). The search revealed 156 reports (5.35%). To be included, the area of decreased radiodensity within the MFC had to measure $\geq 15 \text{ mm}^2$ in area; 52



Fig. 2. Medial femoral condylar cyst.

yearlings met the criteria. Information recorded about each horse included the sale, the size of the MFC lucency (largest proximal-distal cyst dimension multiplied by largest lateral-medial dimension), and the number of limbs affected. Additional radiographic findings for the other joints on the report (four fetlocks and both hocks and carpi) were classified as none, mild, moderate, or severe. Control horses (closest hip number with a radiographic report) without MFC abnormalities were chosen from the same sale as the subjects to be age-matched when recording racing results. The same information was recorded for the control horses as the subject horses. The sex, age, and price paid for all horses were retrieved from online sales records, and racing records were obtained from the Jockey Club's Information System.

Racing performance factors compared the ability to start as a 2-yr-old, the number of 2-yr-old starts, the win percentage of races (for starters) for 2-yr-olds, total starts from 2–4 yr of age, winning percentage (starters) from 2–4 yr of age, and total earnings. The mean values of continuous variables for control horses and subjects (MFC cysts and SCL) were compared using analysis of variance (ANOVA) with post-hoc pair-wise comparisons adjusted for multiple testing using the Turkey correction. Continuous variables included age (in mo), lucency area, price paid (sold horses only), total earnings, total starts from 2–4 yr of age, winning percentage, and (for starters at 2 yr of age only) 2-yr-old winning percentage and 2-yr-old starts. Price paid and earnings were log transformed before analysis to improve adherence to ANOVA model assumptions. Categorical variables including sex, 2-yr-old start (yes/no), and limbs affected were tested for association with the diagnosis groups using two-sided Fisher's exact tests. A χ^2 test was used to determine whether MFC lucencies in unilaterally affected horses showed a side predilection. Significance was set at $p \leq 0.05$.

3. Results

All horses came from the September yearling sales at Keeneland (52 subjects and 52 controls). There were 29 fillies and 23 colts in the subject group and 31 fillies and 21 colts in the control group. Control horses were younger (mean = 17.2 mo) than subjects (mean = 18.1 mo; $p < 0.05$). There were 25 horses with MFC cysts (6 bilateral, 3 left limb only, 16 right limb only), and 27 horses with SCL (8 bilateral, 6 left, 13 right). The right limb was more likely to be affected than the left ($p = 0.001$) in horses unilaterally affected. The radiographic area of the cysts averaged 197 mm^2 (range = 15–580 mm^2), and for the SCL, the radiographic area averaged 133 mm^2 (range = 25–450 mm^2). No radiographic evidence of osteoarthritis was seen in subject medial femorotibial joints. The sales results for control horses are that 2 horses were withdrawn from the sale, 7 horses did not attain their reserve, and 43 horses

Table 1. Racing Results of Yearlings With Medial Femoral Condylar Cysts, Subchondral Lucencies and Unaffected Horses

	Mean 2YO Starts (range)	Mean 2YO Win %	Mean Total Starts 2–4 Years of Age (range)	Mean Winning % (2–4 years of age)	Median Total Earnings (range)
Controls n = 52	1.5 (1–11)	13	9.9 (1–28)	11.6	\$14,748 (0–267,000)
MFC Cysts n = 25	1.6 (1–7)	28	9.12 (1–30)	13	\$12,521 (0–230,000)
MFC SCL n = 27	0.9 (1–5)	13	11.3 (2–28)	16.4	\$27,676 (0–1,280,000)

There is no significant difference between controls and subjects for any performance category. MFC = medial femoral condyle, SCL = subchondral lucency.

(83%) were sold for a median price of \$95,000 (range = \$7000–600,000). For subject horses with cysts, 1 was withdrawn from the sale, 9 did not meet their reserve, and 15 (60%) were sold for a median price of \$32,000 (range = \$6200–100,000). For subject horses with SCL, 1 was withdrawn from the sale, 2 did not meet their reserve, and 24 (89%) were sold for a median price of \$34,000 (range = \$2500–410,000). Control horses sold for more money than horses with MFC cysts or SCL ($p < 0.01$), and fewer horses with MFC cysts were sold compared with controls or SCL horses ($p < 0.05$).

The percentage of horses starting a race as a 2-yr-old is 42% of control horses, 40% of horses with MFC cysts, and 41% of horses with SCL. The percentage of horses starting at least one race from ages 2–4 yr is 90% for control horses, 88% for horses with MFC cysts, and 93% of horses with SCL. Additional racing results are listed in Table 1. Neither the number of limbs affected nor the presence of radiographic abnormalities in other joints had an effect on racing records, and there was no statistical difference between horses with MFC cysts or SCL and control horses for any racing outcome measured. Non-significant p values for racing parameters between cases and controls analyzed included ability to start as a 2-yr-old ($p = 1.0$), number of 2-yr-old starts (starters only; $p = 0.57$), winning percentage of 2-yr-old starts (starters only; $p = 0.23$), total starts 2–4 yr of age ($p = 0.35$), win percentage from 2–4 yr of age (starters only; $p = 0.2$), and lifetime earnings ($p = 0.44$).

4. Discussion

The significance of radiographic findings in untested juvenile stock can be difficult to determine. Each reader uses what objective information is available from the literature and the sum of his or her experience with young racehorse prospects to interpret radiographic findings. Also important to the radiographic assessment is the goal of the specific buyer for that horse. Many yearlings are bought for resale, usually within 6–8 mo, at which time they will again be evaluated radiographically. Subsequent radiographic scrutiny raises buyers concerns about yearling radiographic blemishes. Each reader of

pre-sale radiographs makes his or her best estimation of the risk to buyers' goals based on this necessarily incomplete information.

There was no significant difference in the ability to race between yearlings with MFC cysts at sale time (88% raced) and control horses (90% raced). This is in apparent conflict with a retrospective study that reviewed racing results (64% raced) from Thoroughbred horses with MFC cysts that had arthroscopic debridement.⁵ The largest part of the difference is probably because horses that had surgery were lame, and although lameness examinations were not performed on our subjects, it is unlikely that many had clinical lameness. An additional factor in the high performance ability of study horses is that they are a selected population, both by the sellers and the prospective buyers. This study indicates that the goals of selling and buying racehorses were largely met.

Although preliminary, the results of this study suggest that lucencies of the MFC of Thoroughbred yearlings may have less effect on racing ability than was presently believed. Conservative therapy of MFC cysts has resulted in a return to soundness of 64% of affected horses.^{6,7} A limitation of this study is a lack of information about lameness caused by MFC lucencies or any treatments in the subjects. It is also not clear if our results apply to other breeds of horses; it is important to consider the unique demands on Thoroughbred racehorses and their relatively short careers.

The older age of affected horses compared with controls suggests that early in the season, birth is a risk factor for the development of MFC lucencies in Thoroughbred yearlings. The increased prevalence of right limbs being affected for both SCL and MFC cysts suggests a link between the two. Acquiring more information about MFC lucencies in Thoroughbred juveniles may provide further information about the factors contributing to these radiographic findings.

Based on our experience in evaluating young racing stock, our practice considers SCL of the MFC in sales-age yearlings as delayed or incomplete ossification that is not a threat to a horse's racing ability. We consider cystic lesions to be a greater risk to

performance, because clinical information about the horse is incomplete. Some horses with MFC cysts do become lame, and some of these horses require treatment. If surgery is performed, horses with MFC cysts have a slow start on their racing careers compared with their maternal siblings. Affected horses have a reduced ability to start a race and earn less money per start at 2 and 3 yr of age, but this difference seems to lessen by 4 yr of age.⁵ For most buyers, the presence at the same sale of horses unaffected by MFC lucencies makes the purchase of a horse with cysts less desirable. This study suggests that buyers comfortable with risk can buy affected horses at a lower price than unaffected horses, and they can expect them to perform similarly to unaffected horses at the racetrack.

References and Footnote

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^aFileMaker Pro, FileMaker Inc., Santa Clara, CA 95054.