ORIGINAL RESEARCH

REFEREED

Tattooing of the Equine Eyelid: A Retrospective Study

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ABSTRACT

In this retrospective study, medical records of 26 horses whose eyelids were tattooed were analyzed, and data regarding age, breed, eyelid pigment, eye color, sex, and reproductive status of the horses were compiled. Owners of the horses were contacted by telephone and questioned about their horses. Twenty-six horses were tattooed at Colorado State University (CSU), and one of them was tattooed twice. Records were available for 26 horses, and follow-up results by telephone were completed for 22 of those. Telephone follow-up times ranged from 3 months to 17 years after tattooing. American Paint Horses constituted 62% (16/26) of the cases, followed by Appaloosas (19% = 5/26), and Quarter Horses (8% = 2/26). In 100% (22/22) of cases, the reason for presenting the horse for a tattoo was lack of periocular pigmentation. Only two horses developed ocular or periocular squamous cell carcinoma (SCC) after their tattoos. Although the results of this study suggest that tattooing may be protective against SCC and solar blepharitis, it is by no means conclusive. However it appears to have no deleterious effects, and often owners like the appearance of the tattooed eyelid.

Keywords: Horse eyelid; Tattoo; Squamous cell carcinoma (SCC); Periocular pigmentation; Solar blepharitis

INTRODUCTION

A tattoo is an indelible mark made on the body by inserting pigment under the skin. The practice of tattooing human skin is ancient; tattoos have been found on human mummies as old as the "ice man," who is thought to be over 5,000 years old. It is thought that the first tattoo originated from an accidental wound, such as a burn, that had soot or plant material rubbed into it, which left an indelible mark.[1,2] Tattoos have been used across the ages for decoration and punitive purposes, as well as for identification of people in prisons and concentration camps. In domestic animals, tattoos frequently are used for identification. To our knowledge, although there are many anecdotal reports, there is no scientific literature on the use of tattoos for therapy or prevention of disease. In the 1960s, Glenn Severin began tattooing equine eyelids at Colorado State University (CSU) to prevent solar blepharitis and possibly to prevent squamous cell carcinoma (SCC).

Squamous cell carcinoma is a common periocular tumor in horses. Increased prevalence of the disease may be associated with high altitudes and mean annular exposure to solar radiation.[3,4] Other factors that appear to increase the prevalence of the disease include increasing age of the horse, breed, and sex. Draft breeds and Appaloosas were found to be more susceptible.[3-5] One study found that castrated males were five times more likely to develop ocular SCC than intact males and twice as likely as intact females,[3] but in a separate study,[6] no sex predilection was found. Horses with light skin and hair coat around their eyes (which is often breed-related) have a higher incidence of ocular and periocular SCC.[3-6] The most common sites for the occurrence of SCC were found to be on the medial canthus, nictitating membrane, and limbus. The lower eyelid was also commonly affected.[3-6]

Prevention of solar blepharitis and SCC usually takes the form of protecting horses from ultraviolet radiation by housing them in a stall, or by applying fly masks or sun blockers. Each of these methods has its disadvantages, and no method has proved 100% effective. Fly masks and sun blockers can be rubbed off by the horse, and keeping horses in a stall all day increases restlessness and decreases their exercise opportunities. Melanin pigment in the skin protects against solar damage by absorbing visible and ultraviolet (UV) light and serves as a direct free-radical scavenger.[7] Black tattoo ink absorbs all visible light waves (from 380 to 740 nm) and could also absorb UV waves.[8] In this way, it could also protect against solar damage; however, no evidence could be found that the ink absorbs or protects against UV light. If shown to be effective against solar-induced tissue damage, eyelid tattooing would provide a low-maintenance method of reducing light exposure because it would require only infrequent touch-ups if the tattoo faded.

The aims of this study were to describe the population of horses that had tattoos at CSU, the reasons the owners

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0737-0806/$ - see front matter

doi:10.1016/j.jevs.2008.12.005

Table 1. Horses Tattooed at Colorado State University from 1980 to 2001.

Horse Number	Tattoo Date	Owner Contact	Breed	Age (in years)	Sex	Periocular Pigmentation	SCC Before Tattoo	SCC After Tattoo	Disease-Free Period	Owner satisfaction & Comments
1	1980	Yes	Mix	9	NM	None	No	No	4 Years	Yes (head shyness)
2	1983	Yes	App	13	NM	None	No	No	4 Years	Yes
3	1985	Yes	APH	2	IM	None	No	No	5 Years	Yes (very pleased with cosmesis)
4	1987 1991	Yes	Mix	9	IF	None	No	Yes?	4 Years	Faded to gray
5	1988	Yes	App	10	NM	None	Yes	No	2 Years	Yes
6	1988	Yes	APH	5	IF	None	No	No	17 Years	Yes (faded so redone)
7	1989	Yes	App	12	NM	None	Yes	No	10 Years	Yes
8	1990	Yes	Mix	14	IM	None	Yes	No	1 Years	Yes (blue eyes)
9	1990	No	APH	11	NM	None	No			
10	1991	Yes	APH	1	NM	None	No	No		Yes
11	1992	Yes	App	11	NM	None	Yes	Yes	1 Year	Yes
12	1992	Yes	APH	5	IF	None	No	No	14 Years	No (tattoo missed a spot)
13	1992	No	App	8	NM	None	No			
14	1992	No	APH	2	IF	None	No			
15	1995	Yes	APH	11	NM	None	No	No	11 Years	Yes
16	1995	Yes	APH	4	IF	None	No	No	11 Years	No (head shy)
17	1996	Yes	APH	6	NM	None	No	No	Unknown	Yes
18	1996	No	APH	2	IF	None	No	No		
19	1997	Yes	APH	1	NM	None	No	No	9 Years	Yes
20	1998	Yes	APH	6	IF	None	No	No	7 Years	Yes
21	1998	Yes	APH	1	IM	None	No	No	3 Months	Yes
22	1999	Yes	QH	5	NM	None	No	No	7 Years	Yes
23	2000	Yes	QH	8	NM	None	No	No	6 Years	Yes
24	2000	Yes	APH	9	NM	None	No	No	6 Years	Yes
25	2001	Yes	APH	2	IF	None	No	No	Unknown	No (did not work)
26	2001	Yes	APH	9	NM	None	No	No	6 Years	Yes

App, Appaloosa; APH, American Paint Horse; QH, Quarter Horse; I, mixed breed intact; N, neutered; M, males; F, females.

requested the tattoos, the tattoo procedure, and outcomes of the procedure.

MATERIALS AND METHODS

Medical records of horses that were tattooed from 1980 to 2007 were retrieved from the medical database of Colorado State University Veterinary Medical Center (CSU). Although tattoos were performed at CSU before 1980 (Severin GA, personal communication, 2007), medical records were no longer available for those horses. The retrieved records were analyzed, and the data regarding age, breed, color, eyelid pigment, eye color, sex, and reproductive status of the horses were compiled. In addition, when available, information was obtained about possible preexisting solar blepharitis or SCC, how it was treated, and the posttreatment results. For long-term follow-up information, the horse owners were contacted by telephone and asked a series of questions about the post-tattoo outcomes. A questionnaire was generated, so the same questions were asked of each owner; the same person called each owner.

RESULTS

During the 27-year time period, 26 horses for which records were available were tattooed at CSU, and one of them was tattooed twice (Table 1). Follow-up results by telephone were completed for 22 of those.