

Regrowth of an Equine Hoof Following Traumatic Removal

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This case report is an attempt to put forth chronologically the sequence of treatments used and the problems encountered in the regrowth of the horny structure of the equine hoof.

History

The horse treated was a four year old registered Shetland mare used as a harness pony in parades and horse shows. The mare was pregnant at the time the injury occurred. It was believed that the hoof wall had been torn off when the mare became entangled in a woven wire fence, and that the injury was purely traumatic as no evidence could be found of any pathology leading to a spontaneous sloughing of the hoofwall. Veterinary aid was rendered to this animal within a half hour of the time the injury occurred. This decreased the chances of contamination of the exposed tissues and hemorrhagic shock.

Clinical Examination

Examination of the mare revealed hemorrhage from the right rear foot. On closer inspection it became evident the entire horny structure of the hoof had been torn loose and was absent. A portion

of the sensitive laminae was also absent from the anterior surface at the os pedis. The coronary band appeared to be intact as were the soft structures of the sole and frog (See Figure #1). The mare's body temperature was normal and signs of hemorrhagic shock were absent. Although the mare was of no great monetary value it was decided to attempt repair as she was of great sentimental value, and being pregnant, had the potential for some monetary return.



Picture 1. Side view of the sling used to alleviate fatigue during the convalescent period.

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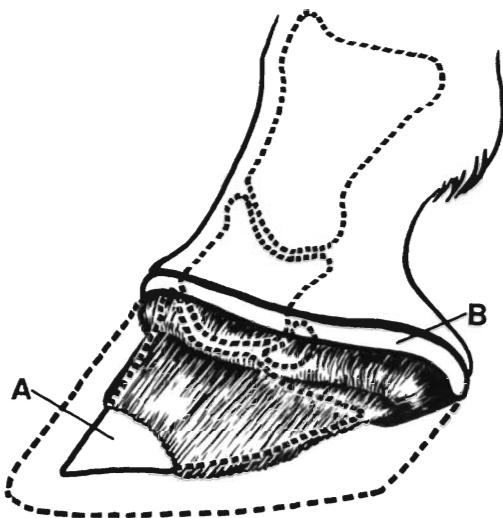


Figure 1. The foot as it appeared immediately after the injury.

- A. Area of denuded os pedis
- B. Coronary band

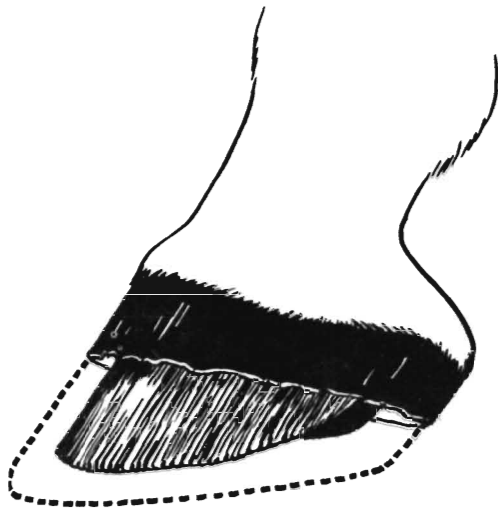


Figure 2. The foot as it appeared one month after the injury. About $\frac{3}{4}$ of an inch of horny wall had regrown.

Course of Treatment

The foot was lightly bandaged and a plaster of paris cast was applied to control hemorrhage. Tetanus antitoxin and an antibiotic preparation¹ were administered intramuscularly. The plaster cast was left in place for a period of seventy-two hours. Antibiotics were given intramuscularly during this period to combat any bacterial contamination that may have occurred.

The mare would place no weight on the traumatized foot. A homemade sling was designed which could be easily applied (Picture 1). The mare was kept in the sling for ten hours each day, during the period that she could not support weight on the injured foot, to alleviate undue fatigue to the other limb.

When the plaster cast was removed the foot was washed with an antiseptic soap² and any necrotic debris was removed. The wound was then bandaged with an ointment³ to which aqueous enzyme⁴ had been added. Although granulation tissue was produced during this time, it was felt that

the healing process was not progressing rapidly enough so two weeks after the injury, a change in medication was made.

To stimulate the growth of granulation tissue over the denuded area of the os pedis a proprietary wound dressing⁵ was used. It was also decided to continue the use of enzyme to keep the accumulation of necrotic debris to a minimum. The enzyme used was an aerosol preparation⁶ which proved to be an excellent choice due to its ease of application.

Three weeks after the injury a healthy bed of granulation tissue had completely covered the os pedis. The coronary band was noted to be viable and new hoof wall was growing distally from it. The use of the wound dressing and bandaging was discontinued. The aerosol enzyme preparation was applied to the foot daily in an attempt to dry the bed of granulation tissue.

Although the enzyme preparation proved to be effective in drying the bed of granulation tissue, an area of exuberant granulation developed which was trimmed surgically. The foot was bandaged to control hemorrhage. Tetanus antitoxin was administered intramuscularly. One day later the bandage was removed and the enzyme was again applied daily.

¹ Azimycin, Schering, Bloomfield, New Jersey

² Weladol, Pitman-Moore, Indianapolis, Indiana

³ Pellzone, National, Kansas City, Missouri

⁴ Aqueous Kymar, Armour Baldwin Lab, Omaha, Nebraska

⁵ Dan Roberts Wound Dressing.

⁶ Trypsyme, Burns Pharmaceuticals, Oakland, California



Picture 2. The foot as it appeared two months post-injury. It has been rasped smooth and grooved in preparation for the application of the hoof repair material.

The growth of the new hoof wall proceeded at a rapid rate and one month from the time of injury about $\frac{3}{4}$ of an inch of new horny wall had regrown (figure #2). The granulation tissue was healthy and completely free of debris so that the application of the topical enzyme was stopped and an astringent⁷ was applied twice daily.

Two months after the injury, the drying process was complete but the new hoof wall had not completely regrown. An artificial hoof wall was fashioned over the distal portion of the os pedis using acrylic hoof repair material.⁸ The new growth of horny wall was rasped smooth and grooved in preparation for application of the hoof repair material. The acrylic material was applied directly over the dried granulation tissue, formed into the proper shape, and rasped smooth (Pictures 2 & 3).

As the new viable hoof wall grew distally from the coronary band it pushed the synthetic material off, simulating growth of a normal hoof. The synthetic hoof wall was subjected to periodic trimming. It required about one and one-half more



Picture 3. The foot after completion of repair with the acrylic hoof repair material.

months before the growth of viable horny wall was complete and the acrylic substitute hoof had been entirely trimmed off.

Results of Treatment

When the new hoof wall was completely grown it had the appearance of a hoof with chronic laminitis. The mare was lame but had a healthy full term foal within a month after the hoof was completely regrown.

The mare was seen again ten months from the time of injury. She was only slightly lame and could be driven to harness.

Summary

The regrowth of a traumatically removed hoof in which the coronary band was intact and viable was carried out using Pelizone ointment and Dan Roberts Wound Dressing to stimulate granulation tissue. Enzyme preparations and vulnerary tincture were used as astringents to prepare the granulation tissue for application of an artificial hoof wall fashioned of acrylic hoof repair material. Complete regrowth of the equine hoof required three and one-half months in this case.

REFERENCES

1. Dan Roberts, personal communication.

⁷ Vulnerary Tincture, Haver-Lockart, Shawnee, Kansas

⁸ Hoof Repair Material, H. D. Justi Co., New York, N.Y.