Use of Castor Oil in Tissue Repair of Extensive Wound in Senile Horse

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ABSTRACT

Background: The use of antiseptics to inhibit or destroy microorganisms through synthetic or natural substances helps speed the healing process. Herbal derivatives of ricinoleic acid extracted from castor beans (Ricinus communis), is an important ally in the treatment of wounds of various animal species during the different stages of the healing process. This study investigates the use of a castor oil based ointment as an antiseptic and wound healing agent to treat an extensive lacerating wound in a senile horse.

Case: A 17-year-old Quarter Horse presenting laceration located in the region of the semitendinosus and semimembranosus muscles of the right hindlimb. No changes were observed upon clinical examination while the haematological parameters creatine kinase and fibrinogen increased due to changes. The lesion initially was 35 cm long, and 19 cm wide and second intention healing was the treatment of choice after evaluation. The experimental use of the phytotherapic based on castor oil (Ricinus Assept®) was suggested. This choice was based on the horse owner request for a low-cost treatment. Following the decision, the treatment started with injury debridement by removing devitalized tissue followed by application of castor oil. This treatment was performed twice a day during 24 weeks, with curettage every 7 days to determine the progress of the healing process. The monitoring of the wound shrinking was performed using a measuring tape. Length and width were measured every seven days, which started on the first day of treatment. In the first week of treatment, there was a significant decrease in purulent secretion, indicating that contamination was subsiding. However, the measurements between the 8th and 9th weeks, after treatment had started, showed the greatest difference in wound length and width. During the 24th week of treatment, the wound was fully recovered, and completely healed, without clinical signs of hypersensitivity to the drug used. After one year, the owner was contacted and reported that the horse did not show any abnormal change where the healing took place and was in perfect health.

Discussion: Much of the clinical practice is spent treating accidental wounds and with post-surgery care. To understand the complexity of the wound healing and the effect of chemicals is essential when making decisions about the most appropriate treatment due to the unique healing nature of wounds in horses. Wound healing is a complex sequence of biochemical and physiological events that can be become even more complicated at advanced age. There are, currently, on the market a large number of topical medications for wounds. The use of phytotherapics in inflammatory and regenerative processes is very promising, as evaluated and proven in other studies with Triticum vulgare, Aloe vera, Stryphnodendron bartatimao, Calendula officianalis and Symphitum officinalis. Countless studies show that the medium chain triglycerides, which are also constituents of castor oil, act positively in the healing process. Castor oil has been shown to be an alternative to treat wounds having bactericidal, chemical debridement, healing, repellent and larvicide properties. This study describes the case of an old animal, and age is an important factor when it comes to the healing process of skin wounds. Despite this fact, castor oil was effective to heal an extensive wound, in addition to being easy to apply and low cost, promoting good antisepsis and the healing process.

Keywords: Ricinus communis, horse, healing, Ricinus Assept®, treatment.
INTRODUCTION

Large injured animals are often treated with various types of drugs by the owners themselves without the correct orientation, in an attempt to save money. In general, the drugs used do not promote the expected result, and sometimes, they even slow down the healing processes in varying degrees while not helping economize [2,8,17].

Proper treatment usually consists of using antiseptics to inhibit or destroy microorganisms by prescribing drugs, such as topical antimicrobial therapy or healing ointments, based on synthetic or natural substances, which further accelerate the wound healing process [4,6].

Among the natural substances, castor oil, a phytotherapic derived from ricinoleic acid extracted from castor bean (*Ricinus communis*), is highlighted. These drugs can be used in all types of lesions in the different stages of the healing process, and to prevent injuries, while they can be an important ally in treating wounds of various animal species [3,11,16,19].

This case report evaluates the use of the castor oil based ointment used as an antiseptic and healing phytotherapic to treat an extensive lacerating wound in an old horse. The results showed that the phytotherapic was very effective while promoting wound healing and controlling pathogenic microbial agents.

CASE

A 17-year-old Quarter Horse, weighing 370 kg was examined due to a wound located in the region of the semitendinosus and semimembranosus muscles of the right hindlimb. The owner could not inform how the wound came to be, but believed it was a trauma resulting from a sharp object present in the pasture.

Upon clinical examination the patient presented, heart rate 38 bpm; respiratory rate, 18 bpm; normally colored mucous membranes; capillary refill time less than 2 s; normal intestinal motility; and rectal temperature, 38°C. The hematological parameters were within the normal range for the species. However, creatine kinase (CK) (5,048 U/L) and fibrinogen (600 mg/dL) levels were higher than normal, indicating muscle and inflammatory changes resulting from the injury presented by the animal.

The lesion affected the skin, subcutaneous tissue and small muscle region, measuring initially 35 cm long and 19 cm wide (Figure 1). The possibility of suture was evaluated, but it was soon verified that tissue approximation was impossible while there was evidence of contamination. Therefore, healing by secondary intention was the treatment of choice.

![Image](https://example.com/image1)

**Figure 1.** Initial Injury, affected the skin, subcutaneous tissue and small muscle region, measuring initially 35 cm long and 19 cm wide.

The experimental use of a castor oil based phytotherapic (Ricinus Assept® - flasks 250 g of ointment) was suggested as a treatment. This drug choice resulted from the demand for a low-cost treatment by the owner. Castor oil is an inexpensive drug compared to other products available in the market, especially in situations when extensive wounds require a long treatment period.

After the chosen treatment was accepted by the horse owner, the procedure of removing the dirt from the affected region was performed, followed by shaving around the lesion, rinsing with water and drying. Dakin liquid was applied and left to act for 5 min followed by another rinsing with water and drying. Subsequently, the debridement of the lesion borders was performed while removing the devitalized tissue. Finally, castor oil ointment was applied all over the wound and edges, gently massaging and leaving it vented. This treatment was performed twice a day during 24 weeks, with curettage every 7 days (Figure 2).
In the first week of treatment, significant decrease of purulent secretion was observed indicative of a receding contamination. However, the greatest shrinkage of the wound both in length and width was observed between the 8th and 9th weeks post-treatment (Figure 4).

The healing progress regarding wound width was faster at the beginning of the treatment, while regarding length was faster at the end. In the 24th week (after 168 days) of treatment, the animal was recovered, with a complete line of scarring at the site (Figure 5).

During the evaluations, the horse showed no clinical signs of hypersensitivity to the drug. One year later, the owner was contacted and reported that the horse did not show any abnormal change where the wound used to be and was perfectly healthy.

### Table 1
Monitoring of the wound shrinking was performed using a measuring tape, width and length were measured every seven days, which started on the first day of treatment, according to the method of Van Wilmink & Weeren [18].

<table>
<thead>
<tr>
<th>Week</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Measurement</td>
<td>35</td>
<td>19</td>
</tr>
<tr>
<td>First</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Second</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Fourth</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>Eighth</td>
<td>22</td>
<td>15</td>
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<tr>
<td>Ninth</td>
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<td>4</td>
</tr>
<tr>
<td>Sixteenth</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Twenty-fourth</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2. Wound in the second week of treatment with Ricinus Assept®. Into detail wound after curettage and application of the product around the lesion.

The monitoring of the wound shrinking was performed using a measuring tape (Figure 3) following the methodology proposed by Wilmink & Van Weeren [18]. Length and width were measured every seven days, which started on the first day of treatment. Table 1 shows the wound measurement data.

Figure 3. Monitoring of the wound size after one week of treatment with Ricinus Assept®, with using a measuring tape, according to the methodology of Van Wilmink & Weeren [18].

Figure 4. Wound of equine after eight weeks of treatment with Ricinus Assept®. Into detail wound after curettage and application of the product around the lesion.
DISCUSSION

Much of the clinical practice is spent with accidental injuries and post-surgery care. Understanding the complexity of wound healing and the effect of chemicals is essential to help making decisions about the appropriate treatment.

There are, currently, on the market a large number of topical medications for wounds. But very little is known about how effective these products are in horses due to the unique nature of wound healing in this species. The beneficial effects of these drugs have already been seen in other species and in-vitro, but have not yet been reproduced in horses [5,18].

Wound healing is a complex sequence of biochemical and physiological events. Most wounds can resolve without intervention of a veterinarian; however, the use of appropriate topical and systemic medications may improve the healing process, resulting in quicker evolution, with fewer complications and without undesirable side effects [2,8].

The use of phytherapeutic medicines to treat inflammatory and regenerative processes is very promising, as shown in other studies with Triticum vulgare [15], Aloe vera [14], Stryphnodendron bartatima o, Calendula officinalis and Symphitum officinalis [12]. These phytotherapics presented satisfactory results, and are recommended for healing processes in horses, which can constitute a single therapy [13].

Countless studies show that the medium chain triglycerides, which are also constituents of castor oil, act positively in the healing process, both for its bactericidal action and interference in various stages of the process [7,9].

Castor oil has been reported as an alternative treatment for wounds since it acts against gram-positive and gram-negative bacteria, in addition to being indicated as chemical debridement and healing agent, able to maintain the bed of the wound moist and accelerate neo-angiogenesis and granulation process [11]. The fact that it is non-toxic; can be applied both in open and closed wounds; is chemotactic for neutrophils; promotes mitosis and cell proliferation; does not develop resistance; and has anti-inflammatory [7], repellent and larvicide [10] properties are additional benefits.

This report describes the case of an animal of old age, and this is an important factor when it comes to wound healing, since advanced age delays the healing process [1,20].

Castor oil was effective to heal an extensive wound of a senile horse. It has been proven to have an great performance since it is easy to apply and provides a good antiseptic action and wound healing at low cost.

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Declaration of interest. The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

REFERENCES


