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## Efficacy of *Calendula officinalis* for large open wound in animals

**Dr. Sandeep Kumar, Ashok Kumar, RN Chaudhary, Ram Niwas, Amit Kumar and Dishant**

### Abstract

The present study was conducted on ten animals irrespective of species, breed, age and sex reported to Department of Veterinary Surgery and Radiology, LUVAS, Hisar with history of large open wounds. Most of the wounds were infected, large in size and many of them having no tendency to heal with routine clinical treatment. All the animals were treated by topical application of 10% *Calendula officinalis* in glycerine base twice a day. Post operative follow up was recorded as gross observations and photographic evaluation for wound area, epithelisation and appearance. Antibiotics were prescribed for three to five days. Initially infected wounds were dressed with acriflavin for one to two days. Wound healing property of *Calendula officinalis* was found more satisfactory than other clinical routine treatment in animals and can be used as alternative medicinal treatment for open wound in animals.

**Keywords:** *Calendula officinalis*, wound, glycerine, healing

### Introduction

An ideal wound-healing agent should be one that facilitates granulation and collagen formation; debrides necrotic tissue and wound slough; promotes normal immunity; minimises microbial colonisation; alleviates pain, facilitates angiogenesis and tissue perfusion<sup>[1]</sup>. From a clinical perspective, an ideal wound healing agent should also be cost-effective, produce minimal patient discomfort and be easy to apply and remove. However, few dressings satisfy all these criteria, although, many therapies from the field of complementary and alternative medicine, particularly plant extracts, come close to resembling an ideal wound-healing agent. Such agents include Aloe, Calendula, Gotu kola, Echinacea, St Johns Wort and Comfrey<sup>[2]</sup>. Of these plants, traditional and laboratory evidence points toward Calendula as being the most favourable wound healing extract to date.

*Calendula officinalis* L. (pot marigold) is one of the commonly used medicinal plants in India, China, Europe and US<sup>[3]</sup>. The plant species has been reported to contain a variety of phytochemicals, including carbohydrates, phenolic compounds, lipids, steroids, tocopherols, terpenoids, quinones and carotenoids<sup>[4]</sup> with different health benefits<sup>[5]</sup>. The pot marigold extracts possess a wide range of pharmacological effects<sup>[6]</sup> and are used as antiseptic, stimulant, diaphoretic, antispasmodic and anti-pyretic agents<sup>[7]</sup>. Despite the potential application of pot marigold in conventional wound management, there has been no systematic study to evaluate the clinical effectiveness of Calendula in wound healing. With this background the present study was carried out with the objective to evaluate the efficacy of *Calendula officinalis* for large open wound in animals.

### Materials and Methods

The present study was conducted on ten animals irrespective of species, breed, age and sex reported to Department of Veterinary Surgery and Radiology, LUVAS, Hisar with history of large open wounds. All the animals were treated by topical application of 10% *Calendula officinalis* in glycerine base twice a day till complete wound healing. Post operative follow up was recorded as gross observations and photographic evaluation for wound area, epithelisation and appearance.

### Results

Most of the wounds presented to Department of Veterinary Surgery and Radiology were infected, large in size and many of them having no tendency to heal with routine clinical

treatment (Table 1). Antibiotics were prescribed for three to five days. Initially infected wound was dressed with acriflavin for one to two days. Then 10% *Calendula officinalis* in glycerine base was applied on wound twice a day till

complete wound healing. Wound healing property of *Calendula officinalis* was found more satisfactory than other clinical routine treatment in animals.

**Table 1:** Detailed gross observations, size of wound, any previous treatment given and time to heal with *Calendula officinalis*

Sr. No.	Species	Gross observations	Approximate size of wound in cm (length × breadth × depth)	Any previous treatment given	Time to heal the wound with <i>Calendula officinalis</i>	Remarks
1	Equine	Severely infected and necrosed wound on left hock joint with no tendency to heal from two month (Fig.1)	30×15×8	Dressing with povidone-iodine	100 days	Healing takes place without any proud flesh formation which is most common complication of wound healing in equines with normal mobility
2	Buffalo heifer	Fresh lacerated wound by fencing wire on proximal to left carpal joint (Fig. 2)	15×3×1	Nil	40 days	Wound heal with minimum scar formation
3	Canine	Third degree burn wound on right ear with second degree burn wound on right facial region before five days	8×2×1	Dressing with povidone-iodine	20 days	Wound healing takes place with minimum scar formation and hairy growth start at facial region
4	Canine	Ulcerative wound on left forehead region from twenty days and showing no tendency to heal	5×4×2	Dressing with povidone-iodine	25 days	Apply betadine on the wound was somewhat irritating to dog which was not noticed with <i>Calendula officinalis</i>
5	Buffalo	Suppurative wound on right tuber coxae region from forty days and showing no healing tendency from routine clinical treatment	15×8×1	Dressing with povidone-iodine	50 days	Wound heal with minimum scar formation
6	Canine	Infected large size wound on ventral to thorax region and another wound on ventral to abdominal cavity (Fig. 3)	8×5×2 6×4×1	Dressing with povidone-iodine	25 days	Apply betadine on the wound was somewhat irritating to dog which was not noticed with <i>Calendula officinalis</i>
7	Goat	Round shape infected wound on ventral to anal region from one week	6×5×1.5	Dressing with povidone-iodine	20 days	Wound heal with minimum scar formation
8	Buffalo	Round shape severe ulcerative wound on left carpal joint with a round shape fibrous tissue growth of near fifty gram weight and showing no tendency to heal from six month	6×6×3	Dressing with povidone-iodine	45 days	Owner tried a number of treatment but no routine clinical treatment was efficient to heal the wound but <i>Calendula officinalis</i> heal the wound
9	Canine	Oval elongated wound on right radius and ulna bone from ten days	12×5×3	Nil	30 days	Wound heal with minimum scar formation
10	Canine	Old suturing wound on linea alba from ten days	6×4×1	Dressing with povidone-iodine	15 days	Wound heal with minimum scar formation



**Fig 1:** Wound in horse on left hock joint in horse at 0, 40 and 120 day.





**Fig 2:** Wound in buffalo on proximal to left carpal joint at 0, 15 and 40 day.



**Fig 3:** Wound in dog on ventral to thoracic and abdominal region at 0, 10 and 30 day.

### Discussion

Traditional texts and animal studies indicate that *Calendula* extract exerts an anti-inflammatory effect [8]. *Calendula* demonstrates free radical scavenging activity against superoxide radicals and hydroxyl radicals *in vitro* in a dose dependent manner; that the same extract inhibits iron ascorbate-induced lipid peroxidation in rat liver microsomes [9]; and that several organic solvent extracts of *Calendula* inhibit lipid peroxidation of liposomes *in vitro* [10], it is argued that *Calendula* may facilitate wound healing via an important antioxidant effect. Polysaccharide fraction of *Calendula*

*officinalis* stimulates phagocytic activity of human granulocytes *in vivo* [11] and phagocytic activity in mice [12], whilst the ethanolic extract of *Calendula* stimulates mixed human lymphocyte proliferation *in vitro* [13]. *Calendula* flower have a high degree of activity against eighteen different strains of anaerobic and facultative aerobic periodontal bacteria *in vitro* [14], and against four different types of fungi, with the inhibitory effect being comparable to that exerted by the antifungal agents Amphotericin B and Nystatin [15]. *Calendula*, for example, may facilitate wound healing by increasing both wound angiogenesis [16] and collagen, nucleoprotein and glycoprotein metabolism [17], leading to improvements in both local circulation and in the formation of granulation tissue [18].

### Conclusion

*Calendula officinalis* possesses a number of properties that make this herbal agent ideal for acute and chronic wound management. Several of these properties are supported by clinical data using topical applications of 10% *Calendula* in glycerine base in the present study.

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