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Effects of Bentonite Clay on Lacerated Wound: A Single Case Study from Tamil Nadu, India.

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Abstract:- To control infection and promote healing, bentonite, a montmorillonite clay, was used topically to treat lacerate wounds. This clay has been used historically for both beauty and burn treatment. This clay possesses anti-inflammatory, antibacterial, and antioxidant qualities. Through the stimulation of collagen production, cell proliferation, and angiogenesis, bentonite clay promotes the healing of lacerations. The production of anti-inflammatory mediators was suppressed when lacerated lesions were treated with bentonite clay. It also has a significant impact on lacerated wound infection management. Bentonite clay's effects on lacerations. In Kulasekharam, Tamil Nadu, India, at the Sree Ramakrishna Medical College of Naturopathy and Yogic Sciences and Hospital, a single case study was carried out. The female participant in this study is 19 years old. Verbal consent was gained following an explanation of the study's objectives. Our research suggests that bentonite clay is an effective treatment for lacerations. It is a natural remedy. This outcome demonstrated that the treatment has a major, non-complicative impact on the healing of lacerations. Future research with bigger sample sizes is advised in order to increase generality.

Keywords:- *Lacerated Wound, Wound Healing, Bentonite Clay, Infection Control*

I. INTRODUCTION

When combined with water, bentonite clay, a naturally occurring clay with a fine, soft texture, becomes a paste. Bentonite functions as a purifying substance. It effectively promotes the healing of skin lesions. To control infection and promote healing, bentonite, a montmorillonite clay, was used topically to treat lacerate wounds. This clay has been used historically for both beauty and burn treatment. This clay possesses anti-inflammatory, antibacterial, and antioxidant qualities. Through the stimulation of collagen production, cell proliferation, and angiogenesis, bentonite clay promotes the healing of lacerations. The production of anti-inflammatory mediators was suppressed when lacerated lesions were treated with bentonite clay. It also has a significant impact on lacerated wound infection management. A pattern of injury called a laceration occurs when the skin and underlying tissues are ripped or cut. This leads to an uneven wound that could be the consequence of impact injuries from blunt items or forces, or it could be the outcome of injuries from sharp things. Most people who have a lacerated wound experience severe bleeding and agony.

II. BENTONITE PROPERTIES

Bentonite clay's primary physical characteristics are its high viscosity, strong colloidal qualities, and ability to absorb water. This clay possesses anti-inflammatory, antibacterial, and antioxidant qualities. Through the stimulation of collagen production, cell proliferation, and angiogenesis, bentonite clay promotes the healing of lacerations.

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A. Bentonite Constituents

Table 1. Bentonite Composition

S. NO	COMPOSITION	CONTENT(%)
1	SiO_2	56.4
2	AI_2O_3	20
3	TiO_2	-
4	Fe_2O_3	7
5	FeO	1.13
6	CaO	1.61
7	MgO	2.78
8	K_2O+Na_2O	2
9	OIc	9.08

B. Minerals

Table 2 Bentonite Minerals

S.NO	COMPOSITION	CONTENT (%) by Weight
1	Chlorite	22
2	Muscovite	22
3	Feldspars	15
4	Montmorillonite	13
5	Quartz	13
6	Kaolinite	9
7	Zeolite	6

III. MATERIALS AND METHOD

At the Sree Ramakrishna Medical College of Naturopathy and Yogic Sciences and Hospital in Kulasekharam, Tamil Nadu, India, a single case study was carried out. The female subject in this research is 19 years old. Following an explanation of the study's objectives, verbal consent was acquired. Bentonite clay, sterile water, cotton swabs, regular saline, and measuring tools are used for the 21-day course of treatment. Unwilling and uncooperative participants are not allowed to participate in this study.

A. Inclusion Criteria

- Verbal consent was obtained from the subject.
- The age of the individual was 19 years.
- The subject under this study was fully conscious, and they could easily read and write.
- Individual with lacerated wound
- Individuals should understand the languages Tamil and English.

B. Exclusion Criteria

- Unwilling and non- cooperative individuals are excluded from this study.
- Any allergic reaction.
- Individual with any other co-morbid illness.
- Individuals who are allergic to Bentonite clay.
- Age below 19 years are excluded from this study.
- Individuals with drug addicts, smokers and alcoholics are excluded.

IV. PATHOPHYSIOLOGY

Determining the depth of a cut can be aided by having a rudimentary understanding of the anatomy of the skin. Understanding the phases of wound healing helps with follow-up care and patient education. Three layers make up the skin: The outermost layer of the skin, the epidermis, is devoid of blood vessels and nerve endings. The epidermis is composed of four layers overall, except for the palms of hands and soles of feet, which have five layers. Nerves, blood arteries, glands, and connective tissue are found in the dermis. Adipose and connective tissue come together to form fascia. The four phases of healing a wound are: The contraction of smooth muscles and tissue compressing tiny arteries is the first sign of hemostasis. Additionally, platelets start to clump together, which starts the clotting cascade and forms the first fibrin clots. Inflammation: Neutrophils triggered by the complement cascade start phagocytosing dead tissue right after and can continue for up to 30 days. Macrophages react after the first 72 hours and go on with phagocytosis during this phase. Proliferation: Angiogenesis starts on the seventh day, which explains the underlying erythema at the location. During this period, collagen is deposited to repair fibrin clots and fibroblasts start to replace the inflammatory mass. Maturation: Type III collagen is converted to type I collagen. At this point, the underlying erythema should go away, and the scar should flatten. To lessen the chance of scar hyperpigmenting, patients should be instructed to massage the scar and stay out of the sun.

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A. Treatment Techniques

Sterilized water, cotton swabs, normal saline, bentonite clay, and measuring tools. The area is first irrigated to clear any debris and clots of blood, enabling a full view of the cut. While saline solutions are typically used, some studies have indicated that tap water can be used to treat wounds in healthy individuals with minor cuts. The injured lower limb is raised in order to effectively stop the bleeding. On a lacerated wound, bentonite clay combined with sterile water is applied as a fine paste. Twice daily. This therapy lasts for 21 days.

V. RESULT

The inflammatory phase starts once effective hemostasis is achieved. Following platelet activation, mast cells release inflammatory mediators that enhance capillary permeability and encourage local vasodilatation to facilitate the migration of inflammatory cells to the site of the lacerated lesion. Proliferation: Angiogenesis, which starts on day 7 and lasts for several weeks, accounts for the underlying erythema at the site. During this period, collagen is deposited to repair fibrin clots and fibroblasts start to replace the inflammatory mass. Maturation: At this point, the underlying erythema should go away, and the scar should flatten. Contraction of the wound occurs. To lessen the chance of scar hyperpigmenting, patients should be instructed to massage the scar and stay out of the sun. The outcomes of this therapy are listed below.

➢ *Day 1*

The patient had a new wound on the first day, and it was on the medial side of the ankle joint. Her regular work is impacted by her limited active range of motion and excruciating discomfort.

Fig 1. 1st day shows, the Subject have Fresh Lacerated Wound.

➢ *Day 7*

A well-defined laceration on the medial side of the ankle joint was discovered on the seventh day. Her normal work was not affected by her limited active range of motion or the mild pain she experienced.

Fig 2 7thday shows, Lacerated wound Which have Well Defined Borders

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➢ *Day 14*

The lacerated wound's size decreased, and its borders were clearly defined on the fourteenth day. Both the discomfort and the active range of motion are still restricted.

Fig 3 14th day shows, the Lacerated wound Size Reduced.

➢ *Day 21*

The well-known lacerated wound healed on the twenty-first day. There is no pain and the active range of motion is normal.

Fig 4 shows,21st day, Lacerated wound Which have Well Known Cured.

➢ *Pain*

Table 1 illustrates that the initial day's pain scale reading is seven (severe). The reading for the seventh day is 4 (moderate), which indicates severe suffering. The 14th day's reading indicates three, which is considered modest pain. The reading on day 21 is zero, which indicates that the pain has subsided.

Table 1 Shows, Pain Assessment

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Pain scale	7	7	7	6	6	6	4	4	4	4	4	4	3	3	3	3	2	2	2	0	0

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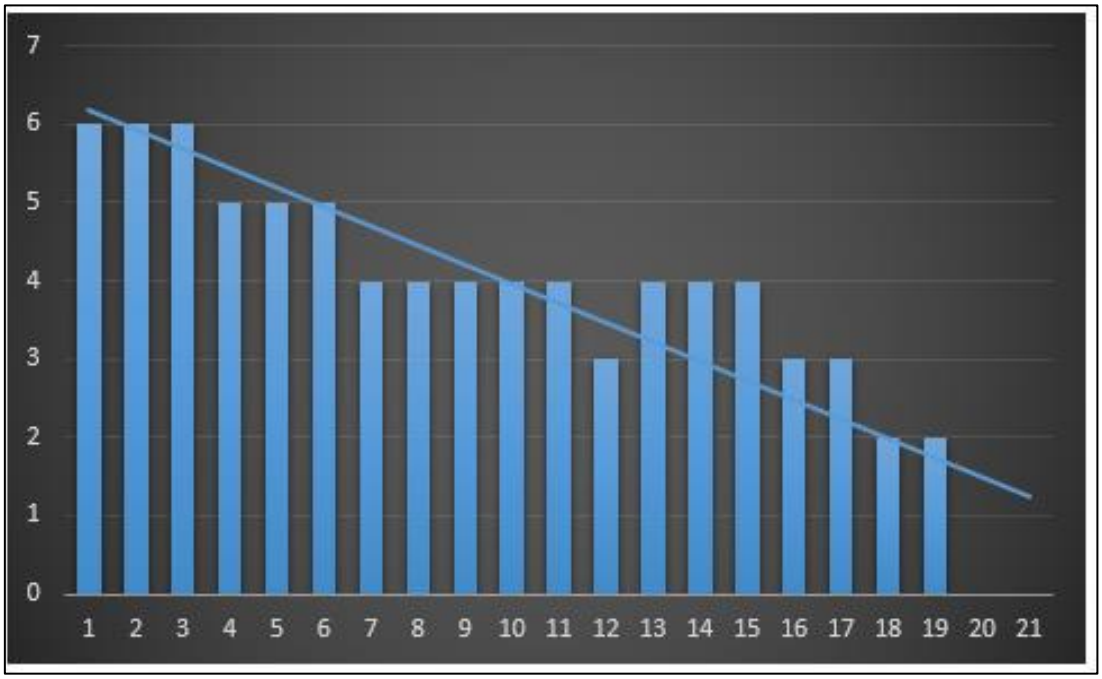

Fig 5, Graph Shows the Changes in VAS

VI. DISCUSSION

Bentonite clay, sterile water, cotton swabs, regular saline, and measurement tools are the supplies used in this case study. The area was first irrigated to clear any debris and clots of blood, enabling a full view of the cut. While saline solutions are typically used, some studies have indicated that tap water can be used to treat wounds in healthy individuals with minor cuts. The injured lower limb is raised in order to effectively stop the bleeding. On a lacerated wound, bentonite clay combined with sterile water is applied as a fine paste. The subject is permitted to be in direct sunlight twice a day, in the morning and the evening. This therapy lasts for 21 days.

The patient presents with a new laceration on the medial side of the ankle joint on the first day. Her regular work is impacted by her limited active range of motion and excruciating discomfort. A well-defined laceration on the medial side of the ankle joint was discovered on the seventh day. Her normal work is not affected by her limited active range of motion or the mild pain she experienced. The lacerated wound shrank in size and had clearly defined edges by the fourteenth day. Both the discomfort and the active range of motion are still restricted. The well-known lacerated wound healed on the twenty-first day. There is no pain and the active range of motion is normal.

There are numerous circumstances in which it is not safe to suture a cut; in these cases, the cut is left to heal on its own. The patient should be accompanied by a wound care specialist. It is necessary to educate these patients about wound care and dressing changes. Should any difficulties arise, such as dehiscence or infection, the patient should be referred back to the treating physician. In these situations, a doctor can help to manage discomfort by cleansing the wounds, applying, or removing the dressing. Thea mechanism, location, and intricacy all affect how well a laceration heals.

VII. CONCLUSION

Our research suggests that bentonite clay is an effective treatment for lacerations. It is an organic remedy. This outcome demonstrates that the treatment has a major, non-complicative impact on the healing of lacerations. Future research with bigger sample sizes is advised in order to increase generality. Public health awareness initiatives should be used to teach adolescent children about lacerations.

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