

# Histopathological Study and Surgery the Effect of Grape Seed Oil on Wound Healing in Rabbits

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**Abstract:** The current study was conducted to evaluate the effect of grape seed oil in the treatment of skin wounds in Rabbits. The rabbit number (20) divided into five groups were used in this study. They wound in the all four group treated with group seed oil 5 c.c on wound after operation until complete healing was occurred, the results revealed the wound healing processing grape seed oil occurred faster than the control group. the healing occurred in 1-12 days after wounding in the all four group, while the control was more than 4 weeks, with the clinical follow up, no complications occurred in the all four group, while the control showed some edema and swelling. Histopathological examination showed the situation process of infiltration of inflammatory cell and fibrous connective tissue formation of granulation tissue in the grape seed oil in all four group was faster than control group. The collagen fiber note after (5) days post treated with grape seed oil. The present study is the first study in the world. Demonstrates that use alternative medicine used grape seed oil is useful for treatment and accelerates healing of wound of skin in Rabbits.

**Keywords:** Grape seed Oil , Rabbits , Wound healing

## 1. Introduction

The grape seed oil is extracted from the seeds of grapes, typically wine grapes. Since grape seeds are usually discarded as part of the wine making process, the extraction and sale of the oil can be a profitable sideline, as well as an efficient use of a byproduct. In the 20th century, it began to be processed and sold in much higher volume, primarily in the United States and Europe. Many stores sell pure grape seed oil for various applications. Because each seed yields a small amount of oil, grape seed oil is usually extracted chemically. The chemical extraction does have an impact on the flavor of the oil, but it makes it more affordable. Grape seed oil is light in color and flavor, with a hint of nuttiness. It is a polyunsaturated oil, and contains beneficial compounds such as linoleic acid<sup>(1)</sup>

There are two primary uses for grape seed oil: cosmetics and culinary applications. Although the oil may congeal slightly, it will go rancid much more slowly when kept cold.<sup>(2)</sup>

The grape seed oil is made by cold-pressing the grape seeds. It has been extensively used around the world. It contains vitamins, minerals, proteins, lipids, carbohydrates and antioxidants. Grape seed oil contains high quantities of Vitamin E and F and also minerals like zinc potassium, copper, calcium, phosphorus, magnesium, iron and selenium. But most of all grape seed oil is rich in proanthocyanidins (OPC) a compound that is high in antioxidants which are 50 times more effective than Vitamin E and 20 times stronger than Vitamin C<sup>(3)</sup>. Antioxidants are found in grape skins and seeds and are more concentrated in red and black grapes.<sup>(5)</sup>

It is suitable for all skin types, it's regenerative properties moisturize the skin and help maintain the elasticity of the skin. It is increasingly used as massage oil. It provides a great relief to the tired and aching body. It is also useful in the preparation of hair care products.<sup>(6)</sup>

Grape seed oil has several important health benefits. It is a good source of essential fatty acids and vitamin E. The polyphenols and flavonoids found in this oil contain strong antioxidant compounds<sup>(8)</sup>. Most of the oil health benefits can be attributed to the presence of these nutrients. These health benefits are enumerated below.<sup>(9)</sup>

## 2. Composition

The following table lists a typical fatty acid composition of grape seed oil.<sup>(12)</sup>

Acid	Type	Percentage
Linoleic acid	$\omega$ -6 unsaturated	69.6% [10]
Oleic acid	$\omega$ -9 unsaturated	15.80%
Palmitic acid (Hexadecanoic acid)	Saturated	7%
Stearic acid (Octadecanoic acid)	Saturated	4%
Alpha-linolenic acid	$\omega$ -3 unsaturated	0.10%
Palmitoleic acid (9-Hexadecenoic acid)	$\omega$ -7 unsaturated	less than 1%

Contains 0.8 to 1.5% unsaponifiables rich in phenols (tocopherols) and steroids (campesterol, beta-sitosterol, stigmasterol).<sup>(12)</sup> contains small amounts of vitamin E, but safflower oil, cottonseed oil, or rice bran oil contain greater amounts. Grape seed oil is high in polyunsaturated and low in saturated fat.<sup>(13)</sup> with no effect on lipid or C-reactive protein levels.<sup>(19)</sup> The US National Center for Complementary and Alternative Medicine reported that oral administration of grape seed extract was well tolerated in people over 8 weeks<sup>(16)</sup>. In one completed clinical trial, grape seed extract did not alleviate the hardening of breast tissue in female patients undergoing radiation therapy to treat breast cancer.<sup>(20)</sup>

## 3. Material and Methods

### 3.1 The Material

Rabbit number 20 divided into five group, each group containing 4 rabbits, the animals prepare for incision in the skin, clapping & shaving & doing incision on the skin and put

5cc of oil in the wound after 5 days take sample from the wound to prepare slide for histopathology to see the process of wound healing, and after 10 day, 15 day & 20 day. in all these to see the stage of wound healing and repair of tissue.

Grossly : the injury of the skin appeared at 5 day its clear wound and without inflammation and contamination and taken after sample from 1cc and put in the 10% formalin for preparation of slide to see the healing process and suture the wound also at 10 day and 15 day and 20 day take the sample from wound in send for histopathology to see the process of healing at 15 day and 20 day there is completely healing and scar formation in the group which treated with ( Gso ) of 12 days and there is scar formation . the clinical examinations shoed simple redness and swelling were observed immediately after wounding with light elevation in temperature of wound area. These signs began to subside gradually during the 2 -3 days after wound in the grape seed oil group. While the wound in control group more swollen and warmer than first group and needed ( 4-5 ) days to subside . There is no infection in to grape seed oil treated Rabbits showed in the control Rabbits exudates. Figure (8) and systemic antibiotic and local antibiotic. The wound in the grape seed oil in Rabbits had completely healing in (10-12 ) days but these signs of haling in the control group where slower and demanded more than 4 weeks complete the healing .



**( Figure 4 )**  
**Take sample of skin after (5) days**



**( Figure 5 )**  
**Take sample of skin after (10) days**



**( figure 6 )**  
**Take sample of skin after ( 15 ) days**



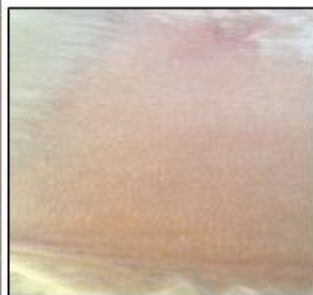
**( Figure 7 )**  
**Take sample of skin after (20) days**



**( Figure 8 )**  
**The control not treated with grape seed oil take sample from control**



**( Figure 1 ) Cage of Animals**



**( Figure 2 )**  
**Clipping and Sheaving and Disinfectant**



**( Figure 3 )**  
**Incision of the wound and application of grape seed oil skin wound in Rabbit**



( Figure 9 )

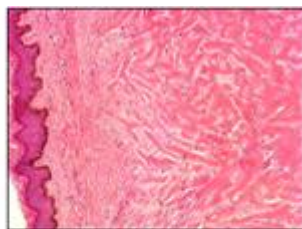
Showing wound healing after ( 5 )days of used grape seed oil



( Figure 10 )

Showing wound healing after (10) days of used grape seed oil

**Histopathological finding :** Treated group the microscopically picture of the wound area at five days post treated with grape seed oil showed collagen Fiber with mononuclear cells (Figure11) at the 5 days wounding the wound revealed large amount of granulation tissue formation with newly blood vessels (Figure12) . The section of skin wound reflected abundant regular collagen fiber the wound area at fifteen days post treatment (Figure13) while the histological picture in control group at(10) days after wound showed hemorrhage with inflammatory cell only cells infiltration with congested blood vessels . (Figure15) section at fifteen day post operation showed collagen fiber with aggregation of inflammatory cell (Figure14) .



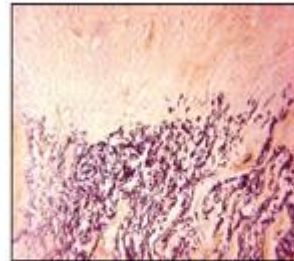
( Figure 11 )

Infiltration of collagen fiber and infiltration of cell Neutrophil's .The beginning of formation of newly blood vessels after (5) day . . H & E 40



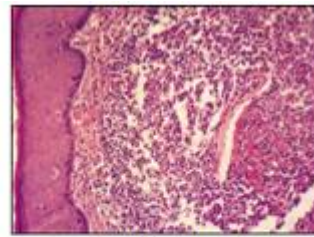
( Figure 12 )

Infiltration of inflammatory mononuclear cell with formation of newly blood vessels .( angina genesis) after (10) days treat with grape seed oil H & E 40



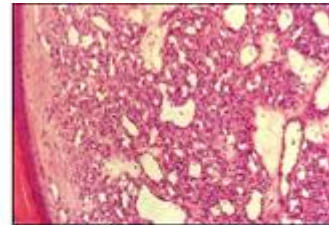
( Figure 13 )

Infiltration mononuclear cell and infiltration of fibrous connective tissue (regular collagen fiber) after (15) days. H & E 40



( Figure 14 )

Formation of fibrous connective tissue with scare formation



(Figure 15)

Control after(10) days formation of blood vessels with inflammatory cell

#### 4. Discussion

The result of the present study show incremental effect on wound healing to grape seed oil treated group in compared to control group. The results of clinical observations were appeared that slight inflammation on the site of operation which was subsided in 2-3 days in grape seed oil. had anti inflammatory activity that rapidly reduces pain and edema. This agreed with authors (4) . According to our finding there was no infection , edema or exudates occurred in the grape seed oil group, which seems to support the results other studies ( 17 ) antibacterial agent and stimulated immune response with in a wound as well enhances wound healing (7) . In second group , two rabbit showed wound infection although it created under a septic infection. Other author (10) reported that grape seed oil has dehydrating effect due to hygroscopic from its

high . The present study indicated that the grape seed oil was very effective in wound healing because its achieved complete healing within 10-12 days and this lead to make the healing process in grape seed oil treated group much faster than control group . this agrees with other workers (10·11) that reports the grape seed oil has the ability to accelerated healing because of its direct effects on tissue and antibacterial properties which include decreases inflammatory edema attracts macrophages which cleanse the wound , provide a local cellular energy source , and protectively covers the wound histologically , the levels of healing process were the highest in the grape seed oil treated group on days 5,10 , 15 , 20 may indicate that grape seed oil in the inflammatory reaction in addition activated the synthesis and maturation of collagen fibers , this agreement with (14) other author ( 15· 16 ) refer to that the grape seed oil hastens wound healing by activation the release of inflammatory cytokines from surrounding tissue cells , mainly monocytes and macrophages as well as activation of endothelial cells and fibroblast the present study demonstrates ( 18 ) . the present study demonstrates that use of grape seed oil useful for treatment and accelerates healing of full thickness wounds of skin in Rabbits .

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