Original Article

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The Effectiveness of Aescin Diethylamine Salicylate in Alleviating Peri-orbital oedema ollowing Septorhinoplasty: Follow-up Study in Basrah, Iraq

Mohannad Mahdi Yaseen [1], Haider Kadhem Saeed [1], Ansam Ghazi Abdulwahid [2]

[1] Alzahara College of Medicine - University of Basrah, Alsadar Teaching Hospital, Basrah Health Directorate, Basrah, Iraq. [2] Alsadar Teaching Hospital, Basrah, Iraq

ABSTRACT

Background: Periorbital oedema following septorhinoplasty is one of the major complications. Various measures have been advocated to alleviate this issue, including the use of a variety of chemical and/or physical materials, such as Aescin. **Aim**: This study aims to evaluate the role of Aescin in reducing peri-orbital oedema following septorhinoplasty. **Methods**: Fifty-four patients underwent primary septorhinoplasty at both Syaab and Saddar Teaching Hospitals in Basrah, Iraq, from September 2023 to September 2024. This randomized prospective interventional study collected data from patients using a designed form during the initial interview. The study population was divided into two groups randomly, group A received Aescin in the form of Aescin Diethylamine Salicylate (Reparil 40 mg oral tablet once daily for 10 days), while Group B did not receive Aescin; each group consisted of 27 patients. Patients in both groups were followed regularly on the 1st, 3rd, 7th and 1 month post operatively. **Results**: Of the total 54, 25 patients were males and 29 were females, representing 46.3% and 53.7%, respectively. Female to male ratio was 1.16:1. Patients' ages ranged from 17 to 42 years, with the majority (57%) in the 20-30 years age group. Eighty-seven percent of the studied patients developed peri-orbital oedema post-operatively. In Group A, 85% developed peri-orbital oedema, of which 73% resolved on the first post-operative day with the use of Aescin (Reparil 40 mg tablet). **Conclusions**: Aescin Diethylamine Salicylate can effectively reduce peri-orbital oedema following septorhinoplasty.

Keywords: Septorhinoplasty, osteotomy, aescin, Basrah, peri-orbital oedema.

Corresponding author: Haider Kadhem Saeed. E-mail: haiderkadhem2012@gmail.com
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INTRODUCTION

Aescin or escin is a mixture of saponins with anti-inflammatory, vasoconstrictor and vessels protection effects found in Aesculus hippocastanum (the horse chestnut).[1] The chemical composition of Aescin is shown in Figure 1.[2] Aescin's mechanism of action is thought to be versatile. Proposed mechanisms include the induction of endothelial nitric oxide production, which increases endothelial cell permeability to calcium ions, and the

induction of prostaglandin F2α liberation. Other possible mechanisms include serotonin antagonism, histamine antagonism, and reduced catabolism of tissue mucopolysaccharides.[3] The principal mechanisms underlying the anti-edematous and anti-inflammatory effects of escin are not fully understood, but they may involve several actions. In vitro experiments have demonstrated that escin strongly inhibits the activity of hyaluronidase, which reduces hyaluronic acid, the main component of the capillary extravascular matrix, thereby decreasing endothelial plasma leakage and explaining escin's effect on edema. A more updated study suggests that the anti-inflammatory effects of escin gel may be attributed to its interaction with the glucocorticoid receptor (GR).[4, 5] The mechanism of action of escin is illustrated in Figure 2.[3]

Septorhinoplasty is a precise and challenging operation involving soft tissue remodeling, bone osteotomy and rasping, cartilage harvesting and grafting, cauterization, bleeding control measures, and finally skin refashioning and suturing into the desired final desired look.[6] These procedures result in multiple traumas to the skin, cartilage, and bone, leading to tissue inflammation, edema formation, cellular activation, compromised vascular supply, tissue hypoxia, and adjacent tissue edema. All of these complications can theoretically be controlled by the use of escin[3]. In this study, we examined the benefit of Aescin Diethylamine Salicylate (escin) in reducing or alleviating peri-orbital edema following septorhinoplasty in Basrah, Iraq.

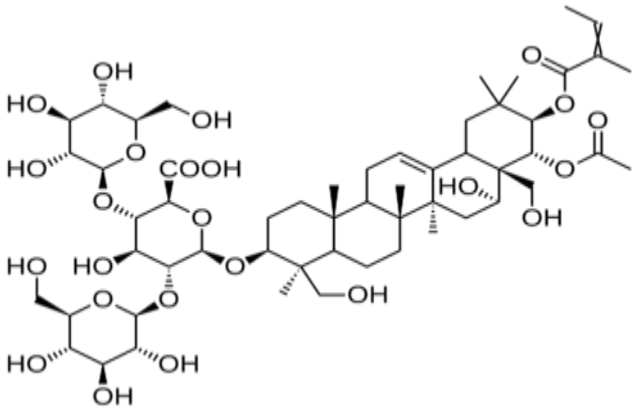

Figure 1: The chemical formulation of escin from European Medicines Agency. Assessment report on Aesculus L., semen; 2009. Available from:http://www.ema.europa.eu/documents/herbal-report/assessment-report-aesculus-hippocastanum-l-semen_en.pdf. Accessed 1030, 2018.[2]

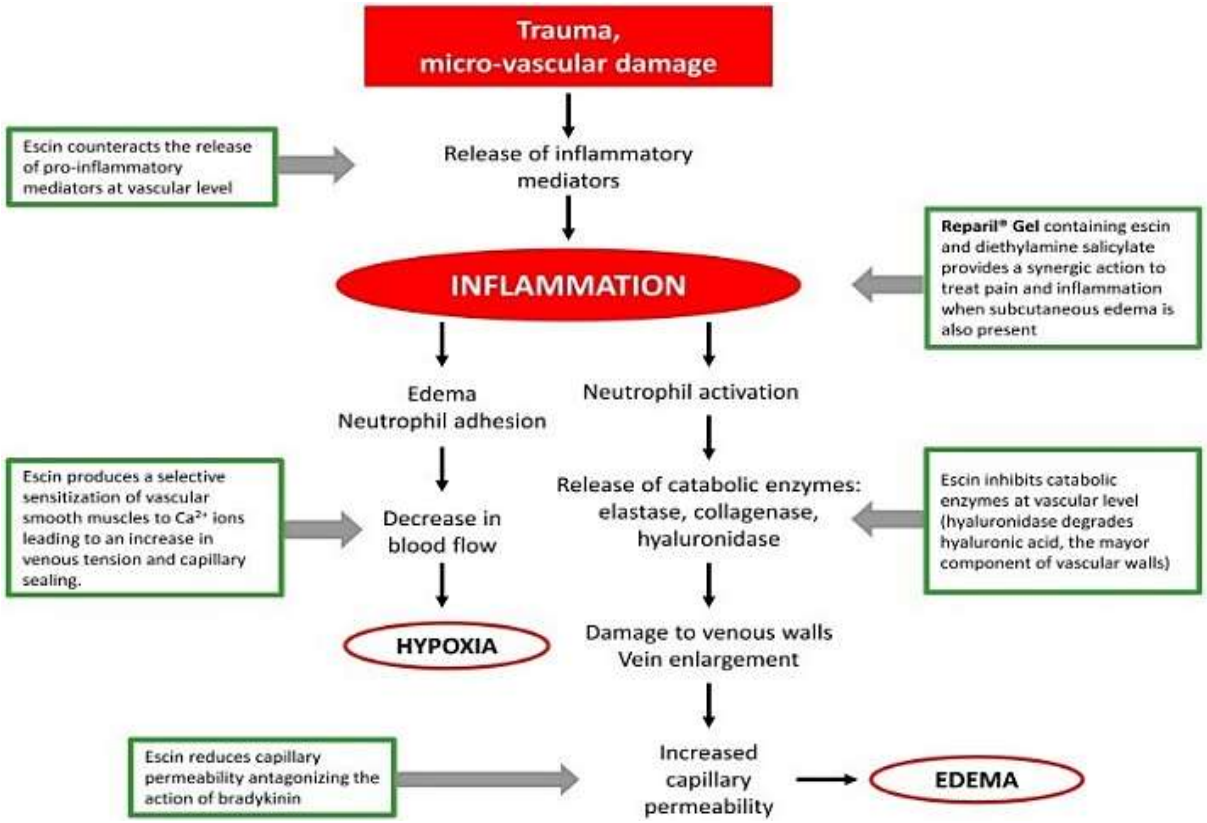

Figure 2: The mechanism of action of escin, taken from Sirtori CR. Aescin: pharmacology, pharmacokinetics, and therapeutic profile. Pharmacol Res. 2001;44(3):183–193. doi:10.1006/phrs.2001.084711529685.[3]

MATERIALS AND METHODS

Study design and setting: This is a prospective, interventional study conducted in the Otolaryngology Department of both Syaab and Saddar Teaching Hospitals from September 2023 to September 2024. Patients: The study population consisted of patients underwent septorhinoplasty as a primary procedure. Fifty-four patients who underwent primary septorhinoplasty were enrolled in this study. No revision cases were included. The cohort comprised 25 males and 29 females. The assessment of peri-orbital oedema was performed for each patient by the same surgeon who conducted the surgery on the 1st, 3rd, 7th, and 30th days post-operatively. Peri-orbital oedema in each enrolled patient was evaluated using a 5-grade visual analogue scale as described by Kara and Gokalan[6], shown in Figure 3

Grade 0: indicates no edema,
Grade 1: minimal or iris not covered by eyelid,
Grade 2: slight covering of iris by swollen eyelid,
Grade 3: full coverage of iris by swollen eyelid,
Grade 4: full closure of the eye.

Data collection: Patients' demographic data were collected by reviewing their pre-operative records. The decision to prescribe escin post-operatively was made using a simple randomization method (coin tossing). The patients were divided into two groups: group A received escin in the form of Reparil 40 mg oral tablets for 10 days post-operatively (27 patients), while Group B did not receive Reparil (27 patients). Informed consent was obtained from all participants prior to enrollment, Patients' identities were kept confidential, and approval from the hospital directory, ethical, and legal sections was obtained. No notable side effects were noted in the group using the medication. The data were analyzed using SPSS (SPSS Inc., Chicago, IL, USA) version 29. Chi-square and independent t-tests were employed to find correlation significance.

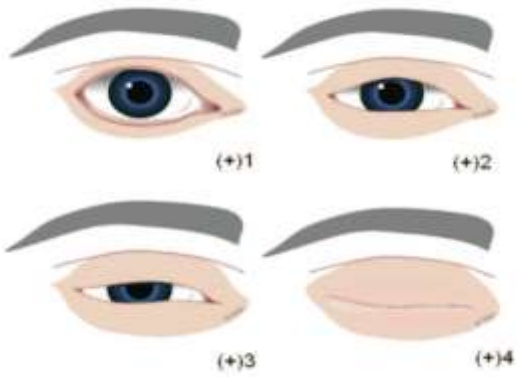

Figure 3: Kara and Gokalan [6] VAS for post-rhinoplasty oedema. Kara CO, Gökalan I. Effects of single-dose steroid usage on edema, ecchymosis, and intraoperative bleeding in rhinoplasty. Plastic and Reconstructive Surgery. 1999;104(7):2213-8.

RESULTS

Fifty-four patients were enrolled in this study, comprising 25 males and 29 females, representing 46.3% and 53.7%, respectively. We found no significant correlation between gender and the use of escin in our study (P-value = 0.834). This is illustrated in figure 4.

The mean age of the studied population was 24.83 ± 6.36 years (range: 17-42 years). distribution of the age groups in the studied population was subdivided into five-year intervals for clarity. The age group distribution curve is shown in Figure 5.

Forty-seven patients developed some form of peri-orbital oedema in the post-operative period, while only seven patients didn't develop any peri-orbital oedema following surgery, representing 87% and 13%, respectively. Those patients were categorized according to the approximate date of resolution of the oedema post-operatively. This is shown in Figure 6 and Table 1.

We found a significant correlation between the use of Aescin Diethylamine Salicylate (Reparil 40 mg tablets) and the rate of resolution of peri-orbital oedema (P-value = 0.008).

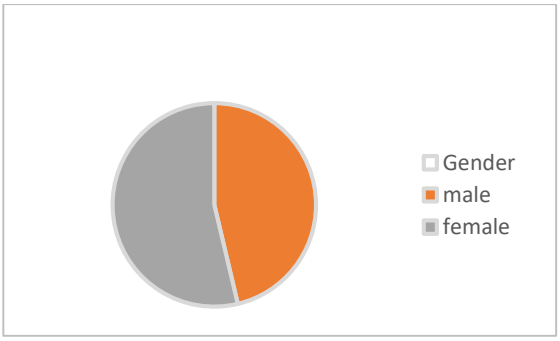

Figure 4: Frequency of male and female patients.

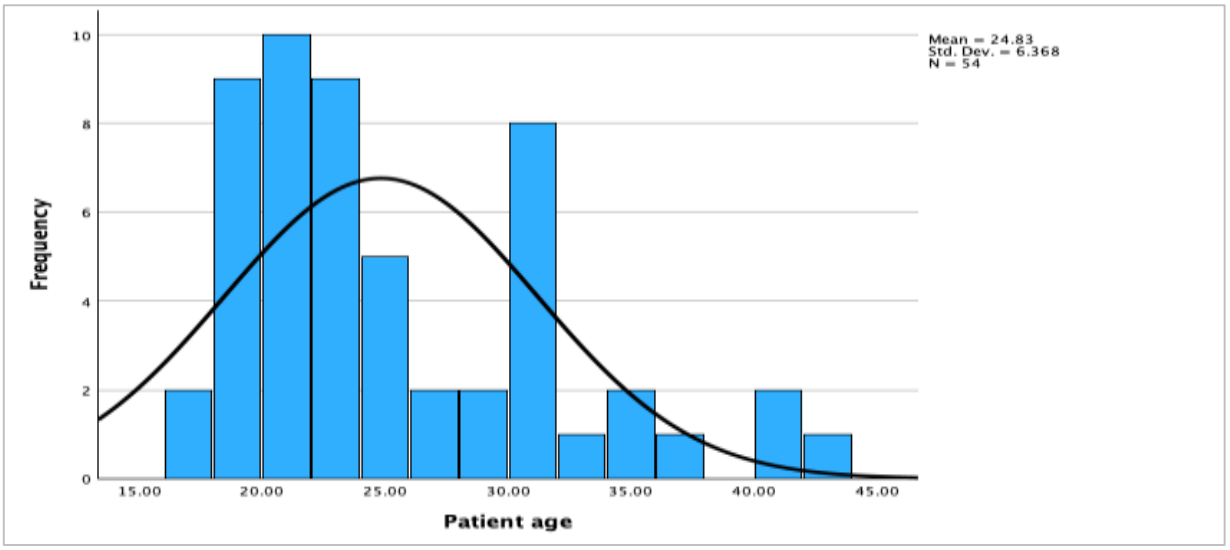

Figure 5: Age group distribution.

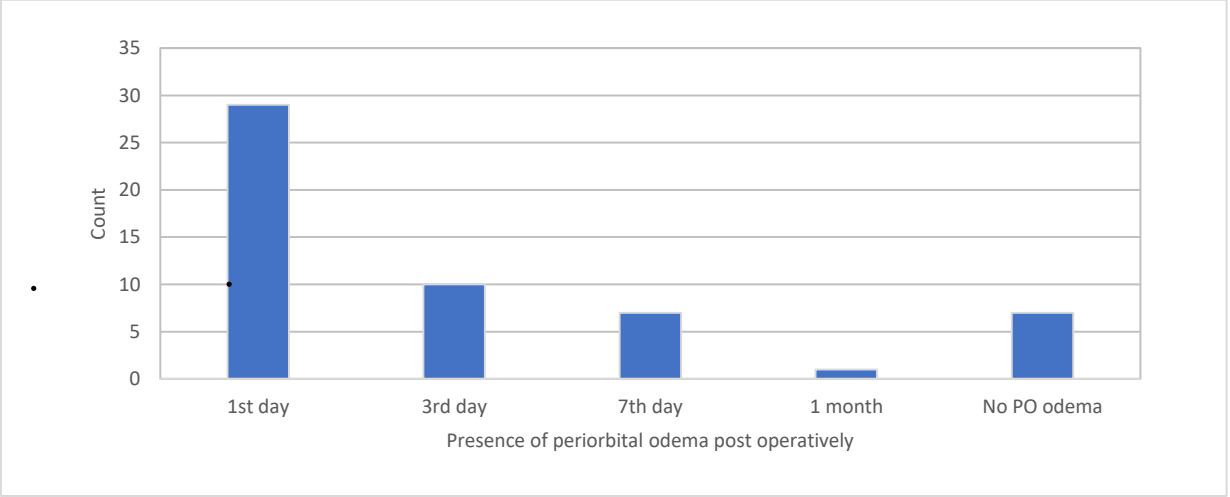

Figure 6: Distribution of periorbital oedema development post-operatively.

Table 1: Presence of peri-orbital oedema post-operatively in both studied groups

Use of Reparil 40 mg post-operatively	Presence of peri-orbital oedema post-operatively					Total
	1st day	3rd day	7th day	1 month	No oedema	
Group A = No	10	6	6	1	4	27
Group B = Yes	19	4	1	0	3	27
Total	29	10	7	1	7	54

DISCUSSION

The role of Aescin in inflammation and edema has been discussed in various preclinical studies over many years. In a study conducted in 1961, intravenous (IV) administration of escin at doses of 0.2 and 2.5 mg/kg significantly minimized acute edema induced in a rat paw model. In the same study, escin was found to inhibit the increase in vascular permeability induced by egg white injection.[7] Periorbital oedema following septorhinoplasty is an undesirable outcome for patients, as it interferes with their daily lives, causing pain in addition to an unpleasant look.[8,9] Different measures have been taken by numerous surgeons to decrease or alleviate the occurrence of peri-orbital oedema post septorhinoplasty like: Ozkan et al.[10], Saadallah et al.[11], Suliman et al.[12], Lee et al.[13], and Turhal et al.[14] In this study, we found that 47 patients developed some form of peri-orbital oedema following septorhinoplasty, representing 87% of the total enrolled patient. The use of escin in reducing post-operative oedema has been established in the literature and has been utilized by orthopedic surgeons for post-operative fractures or soft tissue oedema and inflammation.[15,16] We found a significant relationship between the use of Aescin Diethylamine Salicylate (Reparil 40 mg) and the rate of regression of periorbital oedema following septorhinoplasty in our study (P-value = 0.008). This finding is consistent with the results of Dris et al.[17], Jeong et al.[18], and Fu et al.[19], all of whom utilized Reparil, either orally or intravenous post operatively in various osteotomies for different orthopedic surgeries. However, Zhang et al.[20] did not find any significant effect of Reparil on reducing post-operative oedema following osteotomy, likely due to the low dose of administration (20 mg) and the multiple traumas experienced by their enrolled patients. Up to the time of writing this study, no articles supporting or discouraging the use of Reparil in post-operative septorhinoplasty patients have been found.

CONCLUSIONS

The anti-oedematous and anti-inflammatory effect of escin (Aescin Diethylamine Salicylate) can be effectively utilized to reduce peri-orbital oedema following septorhinoplasty.

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