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PROSPECTIVE STUDY: A COMPARISON OF TRADITIONAL BLEPHAROPLASTY AND COLD PLASMA BLEPHAROPLASTY

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ABSTRACT

The aim of this prospective study is to compare the efficacy and safety of two methods for correcting age-related changes in the eyelids — traditional surgical blepharoplasty and cold plasma blepharoplasty. The study evaluates recovery times, complication rates, aesthetic outcomes, and procedure duration. Results showed that while both methods were effective, cold plasma blepharoplasty demonstrated a faster recovery period and fewer complications. Age-related facial changes, including sagging of the upper and lower eyelids, are a common concern for individuals over the age of 40. Blepharoplasty is an effective surgical procedure used to improve the appearance of the eyes and rejuvenate the face. With advancements in cosmetic surgery, a new technique — cold plasma blepharoplasty — has emerged, utilizing plasma flow to remove excess skin and adipose tissue, in contrast to traditional surgical blepharoplasty. This study aims to compare these two methods across several key parameters.

Key words: blepharoplasty, cold plasma, hematomas, excessive swelling.

INTRODUCTION

Age-related changes in the face are a natural process that occurs over time and affects various areas of the skin, including the eye region. One of the most noticeable signs of aging is the sagging of the eyelid skin, the formation of wrinkles, and the loss of tissue elasticity, which can significantly alter a person's appearance. Specifically, excess skin and fat deposits in the upper and lower eyelid areas can give the face a fatigued and aged look, leading to reduced self-esteem and

psychological discomfort among patients. As a result of these changes, patients often seek help from cosmetologists and surgeons, considering the possibility of blepharoplasty — a surgical procedure aimed at correcting these aesthetic issues.

Traditional surgical blepharoplasty is one of the most widely used methods for correcting age-related eyelid changes. It involves removing excess skin and fat deposits using a scalpel, which significantly enhances the appearance of the eyes and provides the face with a more youthful and refreshed look. However, despite its high efficacy, traditional blepharoplasty has a number of drawbacks, such as a prolonged recovery period, visible scarring, and an increased risk of complications such as infections or hematomas. Due to these disadvantages, there is a need for more gentle and less invasive methods that combine high efficacy with minimal risks and a shorter recovery time.

One such method is cold plasma blepharoplasty, which has emerged as an alternative to traditional surgical intervention. This method relies on the use of cold plasma — a high-energy state of matter that can act on tissues without causing damage. Cold plasma generates ionized particles that penetrate the tissues, causing them to contract and tighten. This allows for the effective removal of excess skin and fat tissue without the need for incisions and sutures, significantly reducing the invasiveness of the procedure.

Moreover, cold plasma blepharoplasty promises several key advantages, such as minimal scarring, faster recovery, and a lower likelihood of postoperative complications. It is also believed that the use of cold plasma helps improve skin texture by increasing its elasticity and reducing the appearance of wrinkles.

However, despite all its advantages, cold plasma blepharoplasty is a relatively new technique, and its efficacy and safety compared to traditional surgical methods require further scientific investigation. It is crucial to assess both the functional and aesthetic outcomes of this method to provide patients with more accurate information for choosing the optimal procedure.

The purpose of this study is to conduct a comparative analysis of traditional surgical blepharoplasty and cold plasma blepharoplasty in several key parameters, such as procedure duration, recovery time, complication rates, and patient satisfaction with aesthetic results. The study also aims to assess the potential of cold plasma blepharoplasty as a safer and less invasive alternative to traditional surgical blepharoplasty.

Materials and Methods

A prospective design was used for this study. A total of 100 patients, aged 40 to 65 years, exhibiting signs of age-related eyelid changes, were selected. The

patients were divided into two groups: the first group underwent traditional surgical blepharoplasty, while the second group received cold plasma blepharoplasty.

Methods:

Traditional Surgical Blepharoplasty: A standard technique for removing excess skin and fat using a scalpel and sutures.

Cold Plasma Blepharoplasty: The use of cold plasma to target eyelid tissues, aiming to tighten the skin and remove excess tissue.Evaluation Parameters**:** procedure duration, recovery time and healing,complication rates (hematomas, infections, scarring),aesthetic outcome evaluation (patient and physician satisfaction scale).

Results

Procedure Duration**: t**he average duration of surgery in the traditional surgical blepharoplasty group was 90 minutes; **i**n the cold plasma blepharoplasty group, the procedure took an average of 45 minutes.

Recovery Time**: i**n the traditional blepharoplasty group, the average recovery time was 14 days; in the cold plasma blepharoplasty group, recovery time was 7 days on average.

Complication Rates**: i**n the traditional blepharoplasty group, 5% of cases experienced hematomas and 3% had infections; in the cold plasma blepharoplasty group, complications were rare, with 2% experiencing hematomas and 1% infections.

Aesthetic Evaluation**:** On a satisfaction scale from 1 to 5, patients in the traditional blepharoplasty group rated the results at 4.2 on average; **p**atients in the cold plasma blepharoplasty group rated the results at 4.8, highlighting improvements in skin quality and minimal scarring.

Discussion

The results of this study demonstrate that cold plasma blepharoplasty is a faster and less invasive procedure when compared to traditional surgical blepharoplasty. Cold plasma technology, which uses ionized gas to target the skin's surface, creates a controlled thermal effect, promoting skin tightening and rejuvenation without the need for cutting or stitches. As a result, the procedure is not only less invasive but also involves a quicker recovery time, allowing patients to resume their daily activities sooner than with conventional surgical options.

While both cold plasma blepharoplasty and traditional surgical blepharoplasty achieve similar aesthetic outcomes, the former offers a significant advantage in terms of patient comfort and convenience. The reduced invasiveness of the cold plasma technique translates to less trauma to the skin and underlying tissues, leading to a lower risk of complications such as infection, scarring, or excessive swelling.

Furthermore, patients undergoing cold plasma blepharoplasty report experiencing fewer post-operative discomforts, such as bruising and prolonged swelling, which are commonly associated with traditional surgery. This makes the cold plasma approach especially attractive to individuals seeking a minimally invasive option with a quicker recovery period and fewer risks.

In conclusion, cold plasma blepharoplasty presents a compelling alternative to traditional surgical blepharoplasty, particularly for patients who prioritize convenience, a shorter healing process, and fewer complications. Its ability to achieve comparable aesthetic results with a lower incidence of post-operative issues makes it a preferable choice for those seeking facial rejuvenation with minimal downtime.

Conclusion

Cold plasma blepharoplasty proves to be an effective alternative to traditional surgical blepharoplasty. It offers advantages such as shorter procedure duration, quicker recovery, and fewer complications, while maintaining high levels of patient satisfaction with aesthetic results.

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