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Application of lower eyelid muscle folding and implantation of silicone prosthesis in the formation of lying silkworms

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Abstract: Objective: To observe the surgical effects of silicone prosthesis implantation for patients seeking aesthetic improvement who desire fuller lying silkworms. Methods: A clinical study was conducted on 50 patients (average age 30±10 years) who underwent silicone prosthesis implantation for lying silkworms at our hospital from August 2024 to May 2025. An incision was made 2 mm away from the lower eyelash, and a sharp dissection cavity was created under the orbicularis oculi muscle close to the tarsus for the implantation of the silicone prosthesis. Additionally, the orbicularis oculi muscles of the upper and lower lips of the incision were folded and sutured to increase the fullness of the lying silkworms. Postoperative effects and complications were observed. Results: Among the 50 patients, 40 were rated as excellent, and 10 were rated as good. The first three days after surgery were characterized by swelling, and some patients experienced bruising and swelling, which obscured the initial effects due to inflammation and congestion. Rapid swelling reduction began on the fourth day, gradually revealing the prosthesis effect. By one month postoperatively, most of the swelling had resolved, and the lying silkworms appeared fuller. Conclusion: The improvement rate of the silicone prosthesis implantation for lying silkworms is 100%, with long-lasting effects. The 2-year maintenance rate remains to be observed, but the effects are durable with few complications.

Keywords: Lying Silkworm Formation; Muscle Folding; Silicone Prosthesis; Minimally Invasive; Permanent

1. Introduction

With the rising demands of people seeking aesthetic improvements and advancements in technology, the fullness of the lying silkworms has become a focal point of attention. In the past, the issue of fullness was addressed through injection methods, but these often resulted in transparency, widening, and the need for regular reinjections due to absorption. Alternatively, the implantation of fascia or dermis (whether autologous or allogeneic) was employed to enhance the fullness of the lying silkworms. However, these materials offer limited support, resulting in a restricted improvement in bulge protrusion and a certain degree of absorption. Therefore, the implantation of silicone prostheses with specific shapes (triangular in cross-section or triangles with inwardly concave sides) and softness offers a durable solution to improve both the fullness and protrusion of the lying silkworms. Additionally, muscle folding techniques can increase the thickness of the orbicularis oculi muscle, reducing the visibility of the prosthesis and providing a permanent solution to improve the fullness of the lying silkworms. This study investigated the improvement of fullness and protrusion of the lying silkworms in 50 patients who underwent orbicularis oculi muscle folding combined with silicone prosthesis implantation for aesthetic purposes. Among the 50 patients, 40 exhibited excellent results in terms of the structure, fullness, and protrusion of the lying silkworms, with no visible prosthesis or other discomforts reported. The remaining 10 patients also achieved good results in terms of fullness and protrusion of the lying silkworms.

2. Clinical data

2.1 Subjects

Clinical data of 50 female patients seeking aesthetic surgery between August 2024 and May 2025 were collected. The patients' ages ranged from 20 to 40 years old, with an average age of (30±10) years. Their body mass index (BMI) varied between 18.8 and 22.3 kg/m2, with a mean BMI of (20.55±1.75) kg/m2. Regarding the baseline conditions of the lying silkworms, the 50 patients were assessed based on three criteria, including the thickness of the musculature in the area, the amount of skin in the lower eyelid, and the height of the inferior orbital bone. Based on a comprehensive scoring system, 40 patients were rated as having an average baseline, while 10 were rated as having a poor baseline.

2.2 Inclusion and exclusion criteria

Inclusion criteria: (1) Subjects with insufficient fullness of the lying silkworms, thin orbicularis oculi muscle of the lower eyelid, and a certain degree of skin laxity; (2) No history of allergy to anesthetic drugs; (3) No other underlying diseases. Exclusion criteria: (1) Subjects with insufficient skin of the lower eyelid or even ectropion; (2) History of allergy to anesthetic drugs; (3) Subjects who do not accept implants; (4) Subjects with hepatic or renal insufficiency, or cardiac insufficiency; (5) History of mental illness.

2.3 Methods

An incision was made 2 mm away from the root of the eyelashes on the lower eyelid. The full-thickness orbicularis oculi muscle and skin were incised, and dissection was performed to the soft tissue on the surface of the tarsus. The dissection continued downwards to the orbital septum. For patients with eye bags, the fat within the orbital septum was removed (similar to the procedure for eye bag removal surgery). A silicone prosthesis (with a cross-sectional shape of a triangle with a side length of 1 mm to 2 mm (Figure 1)) of suitable thickness for the lying silkworms was selected and sutured closely along the soft tissue on the surface of the tarsus to prevent displacement. The orbicularis oculi muscle of the upper and lower lips of the incision was sutured in a folded manner, and some intraorbital fat was removed to deepen the lower line of the lying silkworms. The protrusion of the lying silkworms was observed, and the skin was sutured to complete the surgery. The 3D image of prosthesis was shown in Figure 2.

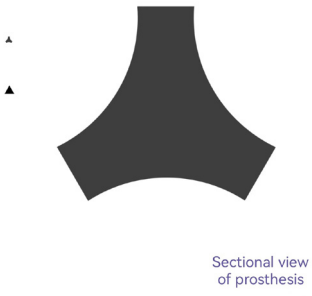

Figure 1. A silicone prosthesis.

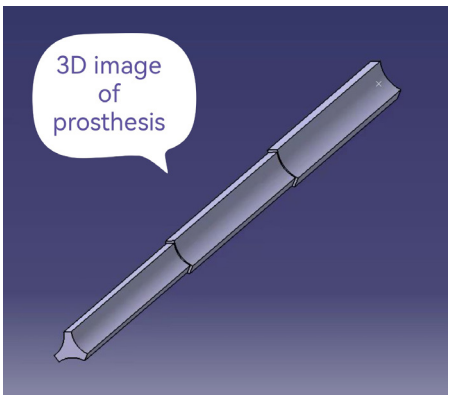

Figure 2. The 3D image of prosthesis.

The core advantage of this surgical technique lies in its ability to restore the natural structure and dynamic changes of the lying silkworms while repurposing the loose skin of the lower eyelids. Traditionally, external incision eye bag surgery achieves rejuvenation of the lower eyelids by removing loose skin, but this approach has the drawback of eliminating the space of the lying silkworms and causing the lying silkworms to become thinner or even disappear once the skin is tightened. This new surgical technique, on the one hand, enhances the protrusion and fullness of the lying silkworms, and on the other hand, utilizes the loose skin, thereby offering the advantage of improving skin laxity while maintaining aesthetic appeal. The central concept of this surgical approach is to increase the protrusion of the lying silkworms. In the past, fillers and implants for lying silkworms were mostly fluids or soft materials that focused on filling volume rather than protrusion, resulting in limited lying silkworm shapes. The reason is that broad volume filling lacks the three-dimensional effect achieved by narrow, supportive filling.

2.4 Evaluation indexes

(1) Record the swelling immediately after surgery, as well as at 3 days, 7 days, and 30 days post-operation. Record the shape and protrusion of the lying silkworms in a resting state, as well as its shape and protrusion when smiling. Note any signs of implant displacement, visibility, or other discomforts. (2) Complete a satisfaction rating scale three months after surgery, with a total score of 100 points. Scores of 90 or above indicate high satisfaction, 75 to 89 indicate satisfaction, 60 to 74 indicate average satisfaction, and scores below 60 indicate dissatisfaction. (3) Criteria for evaluating treatment effectiveness: Excellent: the shape and protrusion of the lying silkworms are evident in a

resting state, and become more pronounced when smiling, without any visible implant or discomfort. Good: the shape and protrusion of the lying silkworms are slightly evident in a resting state, becoming more evident when smiling, without any visible implant or discomfort. Poor: the shape and protrusion of the lying silkworms are not evident in a resting state, and only slightly evident when smiling, without any visible implant or discomfort. The excellent and good rate is calculated as follows: (number of excellent cases + number of good cases) / total number of cases × 100%.

3. Results

3.1 Postoperative complications

All patients exhibited significant swelling at 3 days post-operation, moderate swelling within 7 days, and no obvious swelling at 30 days. Due to the swelling, the shape of the lying silkworms was not prominent at 3 days post-operation. However, at 7 days post-operation, 15 patients showed rapid swelling reduction, and the shape of the lying silkworms became slightly visible. By 30 days post-operation, all 50 patients demonstrated distinct morphological protrusion of the lying silkworms without any visible prosthesis or other discomforts. Follow-up visits will continue in the later period.

3.2 Satisfaction during follow-up

Among the 50 patients, 40 (75%) were very satisfied, 10 (17.5%) were satisfied, and there were no dissatisfied patients. Regarding the facial rejuvenation effects among the 50 patients, 40 were rated as excellent, 10 as good, resulting in a 100% excellent and good rate. A case with the image of the lying silkworms was shown in Figure 3.

Figure 3. A case with the image of the lying silkworms.

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