

# Effect of Expanded Polytetrafluoroethylene Combined with Autologous Ear Cartilage in Nasal Plastic Surgery

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**Abstract: Objective:** To explore the effect of combined application of expanded polytetrafluoroethylene and autologous ear cartilage in nasal plastic surgery.

**Methods:** 76 cases of nasal plastic surgery patients in our hospital from September 2019 to September 2020 were selected as the research objects and divided into experimental group (38 cases, treated with expanded polytetrafluoroethylene + autologous ear cartilage surgery) and control group (38 cases, treated with autologous ear cartilage surgery). The treatment effect, appearance score and complications were compared.

**Results:** The total effective rate of the experimental group (97.37%, 37 / 38) was higher than that of the control group (78.95%, 30 / 38),  $P < 0.05$ ; After treatment, the appearance score of the experimental group was  $(8.97 \pm 0.37)$ , which was significantly higher than that of the control group ( $P < 0.05$ ); The total incidence of complications in the experimental group (5.26%, 2 / 38) was significantly lower than that in the control group (21.05%, 8 / 38),  $P < 0.05$ .

**Conclusion:** In the process of nasal plastic surgery, the combined application of autologous ear cartilage surgery and expanded polytetrafluoroethylene has obvious effect, improves the appearance of patients, and has less postoperative complications, which is worthy of promotion.

**Keywords:** Expanded polytetrafluoroethylene; Autogenous auricular cartilage; Nose plastic surgery; Effect

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Nose plastic surgery is one of the common surgical methods in plastic and cosmetic surgery. It can adjust the size, shape and height of the nose, and then reduce the expansion of the nasal alar. At the same time, it can adjust the triangle between the lips and nose, and make the face more three-dimensional<sup>[1]</sup>. At present, the most commonly used materials in clinical plastic surgery are autologous cartilage, artificial bone, expanded polytetrafluoroethylene and silica gel. Although the effect is obvious, there are still a series of abnormalities such as prosthesis displacement, skin redness and swelling, and rejection reaction in some materials, which affect the effect of clinical surgery. For mild hypertrophy of nasal tip, obvious external opening of nostril, congenital saddle nose or short nasal columella, the application of expanded polytetrafluoroethylene can achieve the goal of nasal plastic surgery, but if the nose shape defect is obvious, the combined application of expanded polytetrafluoroethylene and autologous ear cartilage surgery is needed<sup>[2]</sup>. Therefore, it has a certain practical significance to carry out in-depth research and Analysis on the value of autologous ear cartilage surgery and expanded polytetrafluoroethylene in nasal plastic surgery.

## 1 Material and methods

### 1.1 Baseline data

76 cases of nasal plastic surgery patients in our hospital from September 2019 to September 2020 were selected and divided into control group and experimental group by parity method, 38 cases in each group. In the control group, there were 22 males

and 16 females with a median age of  $(39.35 \pm 3.12)$  years; There were 25 males and 13 females in the experimental group, with a median age of  $(39.32 \pm 3.16)$  years. When comparing the two groups, the above data showed that  $P > 0.05$ , it was considered comparable.

## 1.2 Method

The two groups of patients were prepared before operation. After removing the nasal hair, iodophor was used to disinfect the bilateral nostrils and face, cotton ball was used to properly dip iodophor into the nostrils, and gauze was used to cover the skin around the mouth. In addition, a "V" incision was made on the columella and a single hook was taken to pull the flap upward<sup>[3]</sup>. The cartilage and skin tissue on both sides were cut to separate the concha cartilage, and the cartilage in the ear cavity was taken out for standby. The actual length was controlled at 10 mm. The nose should be carved into shield shape, the columella should be carved into longitudinal slices, and the tip of the nose should be carved into hat shape. After repairing the cartilage edge, it should be sutured and fixed, and the nasal cavity should be filled with sponge, the time is about 3 days<sup>[4]</sup>.

In the control group, the autogenous auricular cartilage was removed and made into two pieces of cartilage and filled with the nasal columella, so as to raise the tip of the nose and extend the nasal columella.

The experimental group was treated with expanded polytetrafluoroethylene and autologous auricular cartilage surgery. A "Butterfly" incision was made at the position of the nasal columella, and the cartilage corners on the lateral side of the nasal alar were fully exposed. The soft tissue of the nasal tip was lifted, and the perichondrium surface was continuously separated until it reached the back. It should be ensured that the nasal prosthesis is suitable for this tunnel, and the micro holes in the prosthesis should be drained on the basis of repeated suction. In the process of suture, ear cartilage should be fixed on the prosthesis tip and septal cartilage to form nasal columella. The prosthesis was placed in the cavity to achieve the purpose of nasal dorsal plasty. Then, the incision and skin were sutured, vaseline gauze was filled in the nose, and the nasal dorsal

external fixation was completed after shaping with microporous plastic<sup>[5]</sup>.

Two groups of patients need to use ice pack on the nose one day after operation, and intravenous drip three days after operation, mainly including vancomycin and metronidazole. The packing was removed five days after the operation, and the suture could be removed two weeks later.

## 1.3 Evaluating indicator

(1) Compared with the treatment effect of the two groups, the clinical efficacy evaluation standard is composed of three parts: markedly effective, effective and ineffective. Among them, the obvious effect is that the nasal shape of the patients after treatment is more natural and beautiful, and the symmetry of the nasal alar is ideal, which is more harmonious with the face; Effective means that the nose is relatively natural and beautiful after treatment, but the nasal alar symmetry is general, and the face is basically in a state of coordination; After treatment, the nasal shape, nasal alar symmetry and facial coordination were poor. The total effective rate of clinical treatment was the sum of significant efficiency and effective rate.

(2) The appearance scores of patients before and after treatment were evaluated. The evaluation indexes included nasal tip performance, nasal tip height, width, nasal columella, nasal dorsal angle and supination angle, and the scores were between 0 and 2. The higher the total score, the better the appearance.

(3) The complications of the two groups were observed, including prosthesis movement, nasal swelling, redness and infection.

## 1.4 Statistical analysis

With the help of statistical software SPSS 19.0, the data of the two groups were processed, and  $P < 0.05$  indicated that the data had statistical significance.

## 2 Results

### 2.1 Treatment effect analysis of experimental group and control group

The comparison of curative effect indexes between groups,  $P < 0.05$  (Table 1).

**Table 1.** Treatment effect of patients (n /%)

Group	N	Remarkable effect	Effective	Invalid	Total effective rate
Experience group	38	20	17	1	97.37
control group	38	14	16	8	78.95
$\chi^2$					6.1758
<i>P</i>					0.0129

## 2.2 Changes of blood lipid indexes before and after treatment

After clinical treatment, the experimental group index compared with the control group,  $P < 0.05$  (Table 2).

**Table 2.** Appearance score before and after treatment in experimental group and control group ( $\bar{x} \pm s$ )

Group	N	Appearance score Before treatment	After treatment
Experience group	38	3.39±0.87	8.97±0.37
control group	38	3.37±0.85	8.01±0.22
<i>T</i> value		0.1014	13.7476
<i>P</i> value		0.9195	0.0000

## 2.3 Comparison of complications between experimental group and control group

There was no significant difference between the two groups ( $P < 0.05$ ) (Table 3).

**Table 3.** Comparison of complications between the two groups (n /%)

Group	N	Prosthesis movement	Nasal swelling	turn red	Infected	Total incidence
Experience group	38	0	0	1	1	5.26
control group	38	3	2	2	1	21.05
$\chi^2$						4.1455
<i>P</i>						0.0417

## 3 Discussion

In recent years, nasal plastic surgery is popular. If the patient has mild saddle nose, prominent nasal tip hypertrophy, obvious nostril exposure, or short nasal columella, he can be treated by routine augmentation rhinoplasty without using autologous cartilage. Only through three-dimensional observation method, reasonable selection of prosthesis materials can be made, and the length, width and height can be determined in combination with the needs of nasal plastic surgery<sup>[6]</sup>. The operation of artificial bone is relatively simple and convenient, but it lacks support function, so it is difficult to use if the nose tip of the patient is low<sup>[7]</sup>. Fixed silica gel is not expensive and has strong biocompatibility. However, the effect of connecting with tissue is not ideal, the shape and naturalness are also poor, and there are even the possibility of rejection and prosthesis displacement and many other abnormal conditions.

Expanded polytetrafluoroethylene has obvious safety, biocompatibility and non-toxic characteristics, and can effectively connect with tissue, with strong structural stability. It will not degrade in vivo, and will not form obvious reaction with tissue. However,

during the actual operation of this method, doctors need to have certain operation skills and be in a sterile environment. Moreover, the appearance of autologous cartilage is more natural, so it is easier to trim and suture<sup>[8]</sup>. In addition, the fidelity of autologous cartilage is more prominent, which can effectively maintain the existing cell morphology, reduce the degree of tissue stimulation, ensure the richness of blood vessels, and improve the survival rate. It should be noted that this method will be affected by the amount of material, if the material is too much, it will change the ear contour, and too little is difficult to match the needs of the nose, which has a great impact on the treatment effect.

In the study, patients in the experimental group were treated with expanded polytetrafluoroethylene combined with autologous ear cartilage, the indicators were compared with those in the control group,  $P < 0.05$ . Therefore, compared with autogenous auricular cartilage surgery, the combined use of expanded polytetrafluoroethylene and autogenous auricular cartilage surgery in nasal plastic surgery has more accurate effect, higher appearance score, less postoperative complications, and significant promotion feasibility.

In general, nasal plastic surgery combined with autologous ear cartilage and expanded polytetrafluoroethylene can significantly enhance the plastic effect and improve the appearance of patients, which has high clinical promotion value.

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