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Original Research Article

Comparative study of follicular unit yield in elliptical versus trapezoid donor strip in hair transplantation

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ABSTRACT

Background: Hair transplantation is a surgical method of management of hair loss. The classical method involves harvesting an elliptical strip from the donor area and dissection follicular units, which are then implanted into the recipient area. A modification of elliptical strip is trapezoid strip, where the ends are tapered to a trapezoid to reduce the transection of follicles.
Methods: 12 male patients with androgenetic alopecia undergoing hair transplantation by strip method were included in the study. One cm strip was harvested from the donor area in all the patients. One end of the strip was designed elliptical and the other end was trapezoid. The ends were dissected and follicular grafts were counted.
Results: The trapezoid end of strip yielded more follicular units in 10 out of 12 cases (83.3%), one was equal and in one case the elliptical end had a greater yield.
Conclusions: Transection of follicular units in the ends of donor strip can be minimized by 30-40% by harvesting a trapezoid strip. The grafts harvested were 28.3% more in the trapezoid end of the strip than the elliptical end.

Keywords: Hair transplantation, Elliptical donor strip, Trapezoid strip

INTRODUCTION

Hair loss is one of the frequent causes for dermatology consultations.[1] Hair loss causes significant social and psychological stress. Alopecia induced by androgens in genetically predisposed individuals is termed androgenetic alopecia.[2] Androgenetic alopecia is the commonest cause of hair loss in men. Though many options of treatment have emerged in the medical management of hair loss, hair transplantation is a more permanent method. Hair transplantation is based on the theory of donor dominance.[3] During hair transplantation the hair follicles from the resistant occipital area are transplanted to the balding region. In follicular unit extraction, single units are extracted from the donor area using small punches.[4] In the classical method of hair transplantation a strip of scalp is harvested from the donor area. It is then dissected to obtain follicular grafts which are implanted to recipient area. Classically the shape of the strip is a horizontal ellipse. There is some loss of follicular grafts at the edges of the strip. Seery suggested that designing a trapezoidal pattern at the edges reduced the transection of follicular units at the edges.[5] The objective of this study was to compare follicular unit yield in elliptical versus trapezoid donor strip in hair transplantation.

METHODS

This was a prospective study conducted at a tertiary care centre over a period of one year from July 2018 to August

2019. Male patients with androgenetic alopecia who wanted hair transplantation by strip method were included in the study. Patients undergoing hair transplantation by follicular unit extraction, and those not consenting for the study were excluded. Ethical committee approval was taken. Counselling was done and informed consent was taken. A routine preoperative evaluation was done.

Preparation of donor area

The hair was trimmed short in the occipital area. After surgical preparation of the donor area, the strip was first designed with skin marking pen. The width of the strip was one cm.

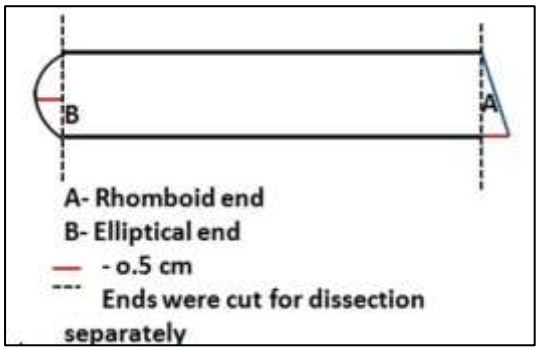

Figure 1: Rhomboid and elliptical ends in the strip.

Figure 2: Marking of elliptical and trapezoid ends of the strip; (A) trapezoid, (B) elliptical.

Figure 3: Donor area sutured primarily; (A) trapezoid end, (B) elliptical end.

The lower border of the strip was extended by 0.5 cm on one end and a trapezoid was drawn. (Figure 1 End A), Figure 2 (End A). A point was marked 0.5 cm away from the borders on the other end. An ellipse was drawn at that end (Figure1 End B) (Figure 2 End B). This ensured that the area in both the ends were approximately equal.

RESULTS

Local anaesthesia with 2% lignocaine was infiltrated along the lower border.

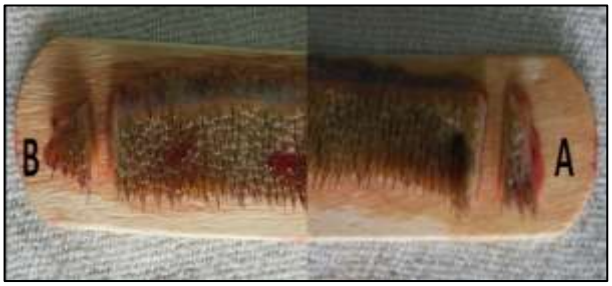

Figure 4: Ends of the strip are cut for dissection; (A) trapezoid end, (B) elliptical end.

Table 1: Follicular units obtained from elliptical and trapezoid end.

Follicular units	
Elliptical end	**Trapezoid end**
17	17
17	30
7	11
11	17
7	16
17	22
18	25
16	9
17	25
14	20
12	24
12	13

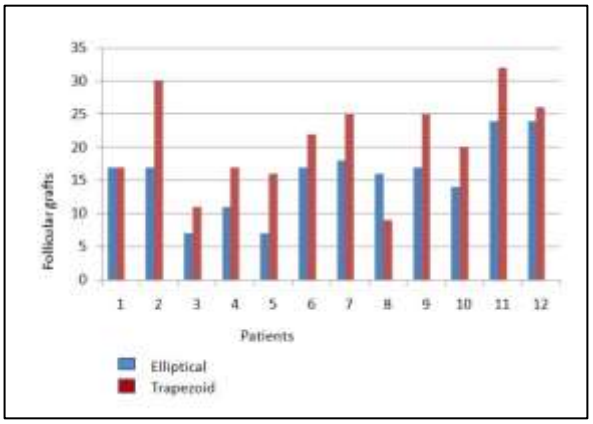

Figure 5: Follicular units harvested from the ends.

This was followed by tumescent anaesthesia. Using a No 15 blade, the strip was harvested from the occipital area. Care was taken to keep the angle of incision parallel to the

hair follicles. Haemostasis was achieved and wound closed primarily without undermining. (Figure 3) Broader bites were taken in the upper border of the trapezoid edge to avoid dog ear. The ends of the strip were cut and dissected separately under loupe magnification. (Figure 4). The grafts harvested were counted at each end. The scar was evaluated at the end of 8 weeks. Statistical analysis used was Unpaired t test.

Figure 6: Scars at the donor area at 8 weeks post operatively.

DISCUSSION

Total number of nontransected single and follicular units from the elliptical and trapezoid edges are shown in Table 1 and Figure 5. The trapezoid end of strip yielded more follicular units in 10 out of 12 cases (83.3%), one was equal and in one case the elliptical end had a greater yield. The scar was a linear at both the ends in all patients when evaluated after 8 weeks (Figure 6). Statistical analysis used was Unpaired t test. The two-tailed p value equals 0.0388. By conventional criteria, this difference is considered to be statistically significant.

Hair transplantation is a surgical procedure for the management of androgenetic alopecia. The occipital area is unaffected by balding process and the hair in this region last a life time; i.e. they are permanent. Since male pattern hair loss shows donor dominance, they can be relocated to the bald area where they will grow in a normal pattern. A single strip, usually of 1 cm centered around the occipital protuberance is the commonly used method to harvest grafts from donor area.[6] Transection of follicles has to be minimized while harvesting the graft from donor area to have optimum number of follicles. The incision has to be placed parallel to the donor hair shafts to avoid transection. Most methods for donor harvesting are blind techniques. The follicular papillae are not visualized on dissection.[7] Many modifications have been described to harvest the strip. The use of multiblade knives shortens the harvesting time, but the blades unavoidably damage many hair follicles along their course.[8] The edges of the strip are more susceptible to transection, due to the change in direction of the incisions. Elliptical strip is the commonly used method. It was noted that surgically tapering the ellipse resulted in significant transaction of the follicles. So Seery designed a trapezoid pattern at the ends to obviate this problem. The lateral limbs of the trapezoid are drawn parallel to the directional orientation of the hair in its immediate vicinity to avoid transecting follicles.

In our study, out of 12 cases, 10 had lesser transection rate than the elliptical end in the trapezoid end. The yield of grafts was 28.3% more in the trapezoid end. One case had equal grafts at both ends. Only in one case elliptical end had a greater yield than the trapezoid edge. There was no difference in the scars at both the edges.

The limitation of this study is the small number of subjects.

CONCLUSION

Hair transplantation is a commonly preferred hair restoration procedure. When a strip is removed in hair transplantation then it is important to ensure that all the grafts are used with minimal transection as it is permanent loss of hair from donor area. Single trapezoid strip from the donor area gives a higher yield of follicular grafts than elliptical strip.

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Ethical approval: The study was approved by the institutional ethics committee

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