Follicular Unit Extraction Hair Transplant (FUE) For Treatment of Androgenetic Alopecia in Al Najaf City.

علاج الصلع الوراثي عن طريق زراعة الشعر بطريقة الاقتطاف في مدينة النجف الاشرف

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الخلاصة:
خلفية البحث: تم إجراء هذه الدراسة لعلاج المرضى الذين يعانون من الصلع الوراثي باستخدام طريقة جديدة لزراعة الشهر وهي طريقة استخراج وحدة البصيلة.
الهدف: تقييم فاعلية وسلامة علاج الصلع الوراثي عن طريق زراعة الشعر بطريقة الاقتطاف لمرضى الصلع الوراثي
المنهجية : تم فحص المرضى لتحديد ما إذا كان المريض مرشحًا أم لا لزراعة الشعر. تم علاج خمسة وثلاثين مريضا بهذا الإجراء الجديد. تم الحصول على تاريخ كامل عن تساقط الشعر، بما في ذلك العمر الذي بدا به تساقط الشعر، وهل يوجد زرع شعر سابقا، وهل يوجد هناك اجراء جراحي في منطقة فروة الرأس وهل هناك تاريخ في تشكيل ندب في المنطقة، والتاريخ الطبي للمريض، تاريخ التدخين وتاريخ فقدان الشعر. تمت متابعة هؤلاء المرضى لمدة ٦ أشهر بعد العلاج لتحديد نسبة الاستجابة وكذلك أي اثار سلبية.
النتائج: بدأ نمو الشعر بعد ثلاثة أشهر وكثافة الشعر تزداد بعد ستة أشهر. ثلاثة مرضى (٨٪) عانوا من انخفاض ضغط الدم الوضعي بعد العملية الجراحية على الفور. تم تسجيل الألم طفيف والحرقة في موقع المنطقة المانحة في جميع المرضى والذي يزال عن طريق استخدام مسكن لإلام.
الاستنتاج: هذا إجراء جديد لعلاج تساقط الشعر لدى الذكور الذين يعانون من الصلع الأندروجيني، والذي لا يترك ندب.
التوصيات: نوصي بإجراء العملية لمجموعة اكبر من المرضى لتقييم فاعليتها.

Abstract:
Background: This study was done to treat patients with androgenetic alopecia by using a new procedure, follicular unit extraction.
Aim of study: To evaluate the efficacy and safety of Follicular Unit Extraction Hair Transplant in the treatment of androgenic alopecia patients
Methodology: The consultation establishes whether the patient is a candidate or not for hair transplantation. A complete history, including the age of onset, previous hair transplants, and scalp surgeries as well as scar formation, also medical, smoking, family and hair loss history were obtained. These patients were followed up to look for the time period of initiation of hair growth, the growth achieved at the end of 3–6 months and any adverse events. The results of patients with noticeable improvement in the photographs and patient satisfaction were recorded at 3&6 months after the procedure.
Results: Thirty-five patients were treated with this new procedure. The hair growth started after three months and density of hair increase after six months. Three patients (8%) developed postural hypotension immediately postoperative and improve by changing position. Slight pain and burning sensation at donor site were recorded in all patients and relieved by taking simple analgesia.
Conclusion: This is a new procedure for treating hair loss in males with androgenic alopecia, that does not leave scars and it is appealing satisfied for both patient and doctor.
Recommendations: we recommend the application of procedure for larger group of patients to assess their effectiveness.

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INTRODUCTION:

Hair serves an important cosmetic function in humans and either the loss or excess of hair causes significant emotional stress. Pattern hair loss (androgenetic alopecia, PHL) represents the most common cause of baldness in men [1]. The term androgenetic alopecia (pattern baldness) has been used for its dependence on the two factors of androgens and genetic background. Pattern hair loss is probably multifactorial and may be inherited as an autosomal dominant trait with variable penetrance. The responsible genes have not been identified, although the term is used for both males and females hair loss [2]. Male pattern alopecia often presents in the first decade after puberty and is characterized by deep bitemporal recession and balding of the vertex, whereas female pattern alopecia, which commonly presents in 4th to 5th decades, is more diffuse, without a bitemporal recession. It is doubtful whether the hair loss seen in women is primarily androgen-dependent and it is

possible that several other factors may be responsible; so the term female pattern hair loss (FPHL) is preferred to the term androgenetic alopecia when referring to women with this type of hair loss [2,3].

Follicular miniaturization is the main step that characterizes pattern hair loss. In androgenetic alopecia, follicles undergo miniaturization, shrinking from the terminal to vellus-like hairs, about 1 cm in length. The anagen duration decreases, more balding follicles are changed into telogen and hair shedding increases. In miniaturization, the duration of anagen may reduce from the normal of 3-5 years to 1 month, but the duration of telogen (3 months) remains the same[4]. The reason why the occipital hair is spared, which is not entirely clear. For reasons that are not well known, the occipital scalp is not androgen-dependent. One hypothesis is that the dermis in the occipital area is derived from cephalic mesoderm, whereas the dermis over the rest of the scalp comes from neural crest derivatives, So that the occipital hairs are permanent and act as donor area for hair transplantation [2, 4].

Hair transplantation is a surgical technique that moves individual hair follicles from a part of the body called the 'donor site' to the bald or balding area of the body known as the 'recipient site'. It is primarily used to treat male androgenic alopecia. In this minimally invasive procedure, grafts containing hair follicles that are genetically resistant to balding are transplanted to the bald scalp. It can also be used to restore eyelashes, eyebrows, beard hair and to fill in scars caused by trauma or surgery such as face-lifts and previous hair transplants [5]. In FUE, the extraction of the intact follicular unit is dependent on the principle that the area of attachment of an erector muscle to the follicular unit is the tightest zone. When this area became loose and separated from the surrounding dermis, the inferior segment can be extracted easily. Because the follicular unit is narrowest at the surface, so needs to use small micro punches of size 0.6–0.8 mm and therefore the resulting in miniscar formation [6, 7].

The main anatomical limitation of the technique is that it is not possible to identify the bulge of the hair from outside and hence the procedure is blind. In addition, since the hairs with intact unit splay at the lower end and diverge in different directions, the process of extraction can result in a higher transection rate [8].

AIM OF STUDY

To evaluate the efficacy and safety of FUE in the treatment of androgenic alopecia patients

METHODOLOGY

The study is a clinical case series which was done in a private center of Al Najaf City/Iraq during the period from March 2016 to July 2017 for Thirty-five male patients with androgenic alopecia treated by using FUE.

Prior to surgery, the patients avoid using any medicines (aspirin, warfarin) which might result in intraoperative bleeding and resultant poor "take" of the grafts. Avoid smoking and alcohol 2 days before and after the procedure. Preoperative tranquilizer (diazepam) in an anxious patient, Blood investigations were performed including hemoglobin, anti-retrovirus 1 and 2 serology, Hepatitis B surface antigen and anti-Hepatitis C. The blood pressure was recorded. Preoperative photographs from top, front, side, and back views were taken. On the day of surgery, the entire donor area from the back of the head was trimmed to 1–2 mm length. The patient instructed to lie down on the operation theatre table in prone and supine positions for the complete local anesthesia. The ring block was administered in the frontal and occipital scalp using a 31 G needle, infiltrating 2% xylocaine with adrenaline. Thereafter, tumescent anesthesia was administered using 40 ml of normal saline, 10 ml of 2% xylocaine and 1 ml of adrenaline (1:1000).

After administering of tumescent anesthesia, 4-5 test grafts are separated and extracted to look for the size and length of the grafts. The grafts are then extracted from the donor area with the help of 0.8 mm special micro punches. After extraction, the assistant gently takes out the graft with the help of forceps. After collection and calculate a number of extracted grafts then preserved in separately on pieces of gauze in Petri dishes containing cool Ringer's lactate solution, the extracted graft may consist of 1 to 3 or rarely even 4 or 5 hairs. Then make hairline and small incision by using special blade according to the size of hair graft in recipient site, then insertion the graft one by one with special forceps.

The postoperative patient takes a systemic antibiotic, a short course of systemic steroid and simple analgesia. Complications are infrequent. Swelling of forehead may occur on day 3 of surgery, due to edema and the result of a large amount of saline being injected during anesthesia. This is temporary and can be prevented by using the band in the forehead for five days. During the first twenty days, virtually all of the transplanted hairs, inevitably traumatized by their relocation, will fall out. This is referred to as "shock loss". After two to three months, new hair will begin to grow from the moved follicles. The patient's hair will grow normally and continue to thicken through the next six to nine months. The patients were seen regularly every 4 weeks after procedure and record time initiation of growth of hairs. Each visit, we evaluated the response to the treatment, recorded the side effects and took photographs. All the patients were evaluated objectively and subjectively regarding their initiation of hair growth after the procedure.

The objective method included Photographic assessment. Color photographs for each patient were performed at the baseline and at each visit during the follow-up period. Photographs for the site of baldness were taken using Sony- Digital, high sensitivity, eight megapixels, DSC-W30 still camera, in the same place with fixed illumination and distance. The percentage of hair growth was determined by assessment of photographs at the end of the study in computer view blindly by two independent, out-of-the study, dermatologist, and they notified their opinions about the degree of improvement.

The subjective method is the Patient's satisfaction with hair growth. Patient satisfaction questionnaire with FUE procedure in terms of hair growth was recorded on linear analogue scales (LAS) with 0 = not at all satisfied and 10 = extremely satisfied. Any incidence of immediate or delayed complications was assessed and recorded at each visit, including pain, crusting, and/or folliculitis at donor and recipient site. Statistical analyzes were carried out using descriptive and analytical statistics using a scientific calculator and SPSS version 10 (P-value of ≤ 0.05 as significant).

RESULT:

Figure (1): the scalp of thirty-one year old male patient (A) before and (B) after the follicular unit extraction procedure showing significant improvement.

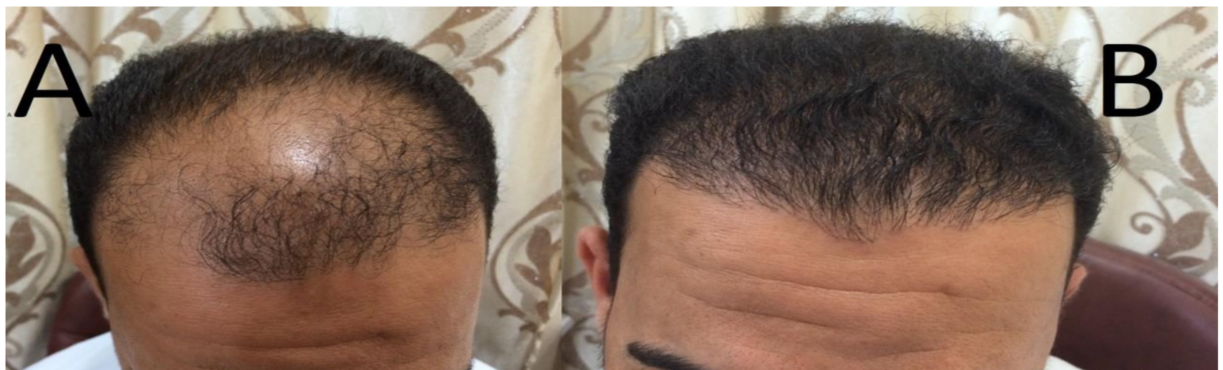

Figure (2): the scalp of twenty nine years old male patient (A) before and (B) after the follicular unit extraction procedure showing significant improvement.

This study included thirty-five patients. Their ages from 25-53 years with mean ± SD of (31.1±6.1 years). The duration of baldness varies between 4 - 30 years with mean ± SD of (8.9± 4.6 years). According to Hamilton classification for baldness types II 4 (11%) patients, were of baldness type III 20 (57%) and type IV 11 (31%). The results of the visual assessment of hair growth on scalp for a computer view of each patient's photographs before and after treatment were tabulated (figure 1, 2).

Table (1): Mean Percentage of hair growth and P value after three & Six months of hair transplant.

Type of baldness	Number of patients	Mean Percentage of hair growth (%)		P value
		After 3 months	After 6 months	
II	4	50	77.5	<0.001
III	20	57	81	<0.001
IV	11	61.8	88.6	<0.001

Statistically highly significant percentage of hair regrowth (P value= 0.0001)

Table 1: the result was assessed after three and six months after the procedure. At third months after FUE treatment, the mean percentage of hair growth of type II baldness (50%), type III (57%) and type IV (61%). While after sixth months, the resultant increase was type II baldness (77%), type III (88%) and type IV (81%). All patients had a significant percentage of hair growth after third and six months of procedure and the P value =0.0001(statistically highly significant)

Table (2): Linear analogue scales are displayed for hair growth after three and six months of hair transplant.

Type of baldness	Number of patients	Mean Satisfaction in terms of hair growth		P value
		After 3 months	After 6 months	
II	4	5.5	8.5	<0.001

III	20	5.6	9.1	<0.001
IV	11	5.6	9.1	<0.001

Patients satisfaction with hair growth was statistically highly significant (value=0.0001)

Table 2: the median satisfaction of the patient was assessed at three and six months after procedure according to the visual analogue score. At third months, median patient's satisfaction scores for baldness type II, III, IV were 5.5, 5.6, and 5.6 respectively. At the end of follow up period, patient satisfaction was increased to a median of 8.3, 9.1, and 9.1. Patient satisfaction with hair growth was statistically highly significant at all stages of follow - up (P value=0.0001

Three patients (8%) developed postural hypotension immediately postoperative and improve by changing position. Slight pain and burning sensation at donor site were recorded in all patients and relief by taking simple analgesia.

DISCUSSION:

Despite being an extremely common entity, androgenetic alopecia (9) can cause significant psychosocial impairment of quality-of-life of the affected individuals (10). Medical treatment of AGA has advanced with a better understanding of the biochemistry and physiology of hair growth and hair loss, but currently, there are only two pharmacologic treatments approved by the United States. Food and drug administration to treat male pattern baldness namely minoxidil and finasteride (11), Optimal aesthetic results can be achieved by combining medical therapy with surgical transplantation of follicular unit grafts (12). There was a gradual transformation from 10 to 20 hair plugs to the natural 1 to 4 hair follicular units (13). The switch led to complaints from patients about residual linear scarring at the donor area of the patient's scalp. To overcome this problem of donor scar, FUE (14) was devised by Rassmann and Bernstein in 2002.

In the present study, we used FUE procedure. FUE can give very natural results and has advantages of avoiding a linear scar and less post-operative pain. However, it has disadvantages of increased surgical times, graft fragility and increased the cost to the patient.

In comparison with strip method (19), it needs one doctor with one or two assistants can run a center. The procedure is less traumatic, the surgical experience is not essential, minimal post-operative recovery time, and microscopic scars in the donor area are almost invisible.

In the present procedure, the results same with direct hair transplant modified follicular unit extraction technique but with long time and prone position (15).

CONCLUSION

This is a new procedure for treating hair loss in males with androgenic alopecia, that does not leave scars and it is appealing satisfied for both patient and doctor.

RECOMMENDATIONS

We recommend the application of procedure for larger group of patients to assess their effectiveness.

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