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BIOFIBRE HAIR IMPLANT – IMPACT ON THE QUALITY OF LIFE

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Body image refers to how we feel about our bodies. It does not refer to what we actually look like, but rather to our perceptions, opinions and ways of thinking about our appearance. How we feel about our appearance is part of our body image and self-image. The hair is a significant part of this image. The problem of alopecia affects both sexes and all ages with significant sequelae. Along with androgenetic alopecia, there are forms of alopecia of various origins: traumatic, surgical, pharmacological and others. Polyamide artificial hair implant (Biofibre®) is one of the current techniques used to treat this problem.

It is recognized worldwide that a favourable perception of one's appearance can enhance self-confidence. The hair significantly contributes to this perception. For example, the problem of alopecia affects both sexes and all ages with significant sequelae (1). Along with androgenetic alopecia, there are forms of alopecia of various origins: traumatic, surgical, pharmacological and others (1). Polyamide artificial hair implant (Biofibre®) is one of the techniques available today to treat this problem.

Biofibre® hair implant success depends on three decisive factors: high quality of the fiber, correct implant techniques and choice of a suitable patient (1). This hair restoration procedure is performed in cases connected to lack of a donor (2), in the setting of an atrophic or cicatricial scalp (3), when patients refuse invasive techniques and for patients with burn sequelae (4). In all these cases, fiber can be used as a reconstructive or cosmetic hair restoration treatment solution to allow the patient to promptly recover the expected aesthetic result with significant improvements of self-esteem and social

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life. Biofibre® is suitable both for male and for female patients from 18-years-of-age onwards. This technique can be used alone or in combination with other hair restoration techniques (5, 6).

Suitable fibre

The modern hair implant (Biofibre®) is the result of more than 20 years of investigation and experience in biocompatibility materials and is approved as an implantable hair prosthetic medical device. Thanks to its safety features, this fiber allows creation of a keratin sheath, which, by protecting the pseudo-infundibula from external contamination, reduces possible cutaneous irritation (7). If necessary, the anchoring system enables the fiber to be pulled out without residual adverse effects; this reversibility is an additional important safety feature (8). Biofibre® is very similar to natural hair: soft, flexible, fine and resistant. These characteristics enable rapid cicatrization, trauma-free skin following implantation, and a long-lasting aesthetic result. The mechanical strength of this hair implant fiber is 3 times greater than that of natural hair and allows the best preservation over time. It is available in 13 colors, which, if properly mixed, satisfies most patients' demands. Length ranges from 15 to 45 cm and it is also produced in different shapes: straight, curly and wavy. It can be washed and dried like natural hair. It can't be bleached or permanent-waved. To increase hair density in the crown area it is now available as new high-density fibers (MHD®); this allows three times more volume, reducing the quantity of hair needed to reach the expected result and therefore minimizing the need for additional procedures (8).

Patient selection

Patient selection is very important to assess suitability both from a physical and psychological point of view. The clinical history of the patient, a general physical examination, assessment of scalp conditions and a physiological profile are necessary. The suitable patient for implant must be in good health, have a healthy scalp and be able to follow the rules described in the post-implant protocol, which provides for periodic medical checkups and cleaning of the scalp. Also the expectations of the patient have to be considered. A pre-implant protocol, entailing a sensitization test of 100 fibers, is carried out one month prior to the implantation sessions to limit the risk of possible subjective reactions (9).

The following conditions are considered unsuitable for this treatment: seborrhea, eczematous or proliferative diseases, chronic skin inflammation, anxiety, depression, hypomanic states, chronic metabolic diseases, allergy, immunodeficiency, and working activities where hygiene cannot be guaranteed and maintained.

Pre implantation laboratory blood tests are required. Patients must be informed that about 10% of their implanted hair will be lost each year (10); this is very important, both to assure that the patient is prepared for this normal circumstance and to not adversely affect their confidence in the procedure. Patients should also be informed that the Biofibre® hair implant requires good hygiene and care, that permanent or other aggressive treatments cannot be performed, and that certain specific products have to be used periodically. Periodic medical checkups must be performed and patients need to follow this requirement. The first such checkup occurs 4 weeks after the test implant, or sooner if any problem occurs. Standard follow-up is about every 3 months, but the frequency may have to be customized. In any event, if problems arise, the patient must promptly inform the implant physician in order to reach an appropriate resolution.

Implant

One week before the implant, the patient should avoid ingestion of salicylic acid derivatives. One day before implant, smoking and alcohol are to be avoided, and the patient should start taking a systemic broad-spectrum antibiotic; these instructions should also be followed in the days following the implant. In order to achieve the best aesthetic result, two or more colors of Biofibre® hair are mixed. Since not all areas of the scalp are equally suitable for the implant, implantation should be avoided in areas such as the temples, lower forehead, or sideburns.

Surgical cleaning with betadine is performed before preoperative marking. Local anesthesia is then given.

Biofibre® hairs are implanted one by one in a 45° radius, leaving between each implant a space of 2 mm following the natural pattern of the hair. The implantation is performed by an adjustable implanter or with the new automatic implant machine (11). Both devices fit a special stainless steel hooked needle of 0.25 mm thickness to minimize tissue trauma. The fibers are implanted at the *galea capitis* level, and in one h, about 600 fibers are implanted. To conclude the procedure, the implanted area is cleansed and disinfected with betadine, avoiding any traction on the fibers that might produce unwanted hair loss. An ice pack is applied for 5-10 min and if necessary, an analgesic may be administered (10).

After the hair implant, the patient receives systemic antibiotic therapy for a week, sometimes together with antihistamines and an anti-inflammatory or topical antifungal lotion (depending upon the climate). The first shampoo can be performed after 3-4 d with gentle motions. The hair should not be cut for 2 weeks after implant to avoid risk of infection. A follow-up implant session can be performed after 3-4 weeks. The elapsing time between the two sessions allows a gradual change of image and better psychological acceptance both by the patient and by other people.

Histological and clinical study

Three years after implantation, Biofibre hair is surrounded by hyperplastic epidermis (pseudo -infundibulum) at the level of the papillary dermis and in the uppermost part of the reticular dermis. Inside the pseudo-infundibula, a compact keratin layer adheres perfectly to the implanted fibers. In the middle and deep reticular dermis, the fibers are surrounded by a focally granulomatous chronic infiltrate of limited extent. In the deepest dermis and hypodermis, the fibers are surrounded by fibroplasia, and no inflammatory infiltrate is observed (12).

Among the 133 patients treated with Biofibre® hair implants, the results were considered satisfactory in 96.2% by both physicians and patients in terms of coverage of the area of alopecia and resemblance to natural hair color and texture. Dissatisfaction among the remaining 3.8% of patients was linked to failure of the tolerance test or improper follow up. Of those patients, 2.1% had fibers removed without any residual difficulty (13).

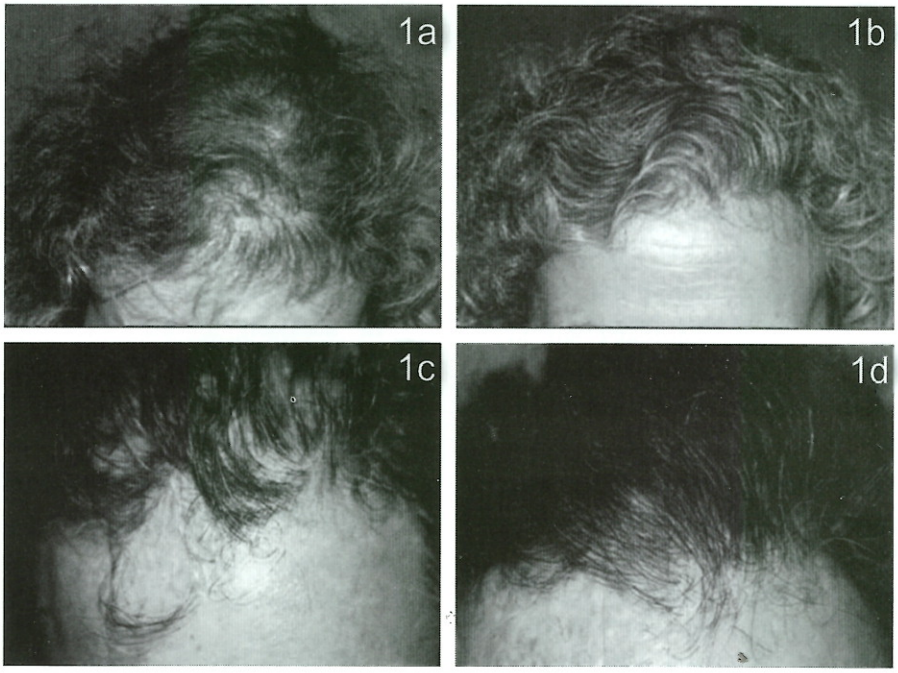

Fig. 1. ***a, b)****: Implant of 2000 Biofibre wave in women in two sessions*; ***c, d)****: Implant of 1500 Biofibre to correct scars in 2 sessions.*

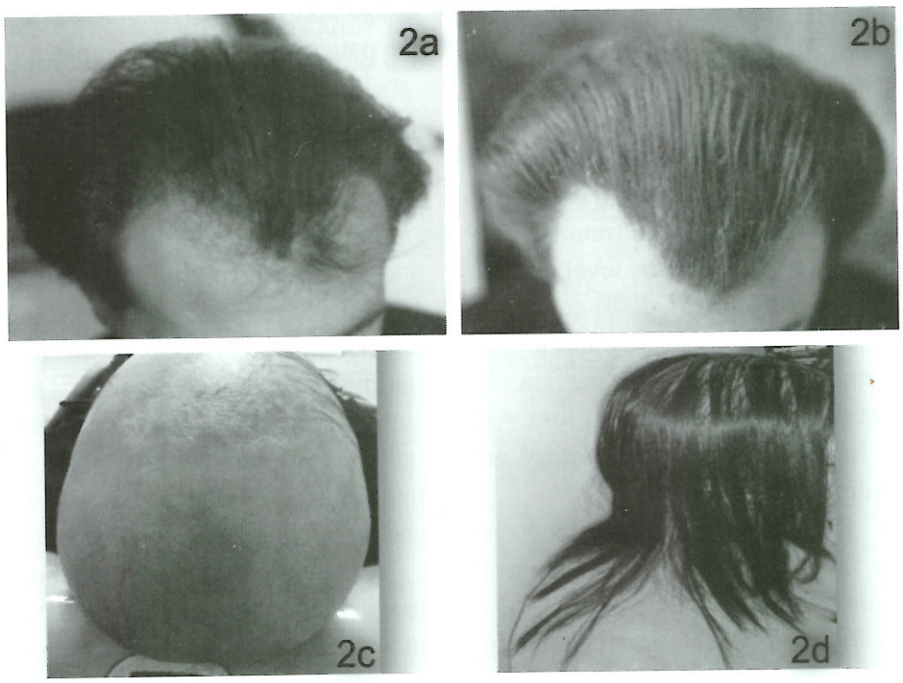

Fig. 2. ***a, b):*** *Implant of 1000 Biofibre in young man in one session;* ***c, d):*** *Implant of 15000 Biofibre long size in a patient with total alopecia in 16 sessions.*

DISCUSSION

Biofibre® hair implants, performed both for reconstructive and cosmetic hair restoration, result in significant improvements in self-esteem and social life (Fig. 1a-d).

Experience has shown that more women suffer from baldness or hair thinning. The social problem in the majority of those cases represents major trauma for female patients, sometimes with severe psychological complications (14, 15). Biofibre® hair implants can be considered a valid option for these cases since they ensure immediate aesthetic results and increased quantity of hair in a short period. Patient can have implant results closely resembling his/her own natural hair, as the hair implant fibers are available in many colors and different lengths and shapes; this can have an immediate, beneficial psychological impact (Fig. 2a-d).

Another important issue to consider is related to total alopecia. Although total alopecia cannot be considered a major indication for Biofibre® hair implants because of the large number of hairs required and the consequent major difficulties of post-procedural management, several such cases were treated with this method in the past year (16-18). Although the clinical results were on average not as good as for other standard applications of this technique, there was nevertheless, enormous benefit in selected cases. The use of Biofibre® hair density (MHD®) in the crown area allows a significant reduction in the quantity of hair needed to achieve an acceptable result and allows less intense after-care procedures. Additional investigations of this treatment and selection of an ideal protocol for total alopecia are the subject of ongoing investigation.

In addition to the these applications, it is important to consider the psychological benefit for all those people who suffer from baldness or who simply want to improve their self-image with a minor surgical technique that can produce immediate results without hospitalization.

CONCLUSION

Biofibre® hair implants should be considered part of the armamentarium to be used in hair restoration treatment, especially because of the high

quality of cosmetic results and prompt psychological benefits. A low-impact and rapid procedure that can be performed on suitable patients with automatic or manual devices. The fibers that are used are available in 13 colors, in straight, undulated or curly shapes and three different lengths to satisfy all patient requirements. This implantation technique is suitable for treatment of many different types of alopecia in male and female patients from 18 years onwards, as it ensures immediate results and rapid return to a normal social life. It can be used alone or in combination with other hair restoration techniques. Additional applications will be the subject of investigation in the coming years.

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