The U.S. Food and Drug Administration (FDA) has banned the use of artificial hair fiber since 1982. However, other than the United States and Canada, artificial fiber implantation (AI) is permitted as a medical procedure by authorities all over the world. Disputes remain in regard to the frequency and severity of the potential risks of AI.

Some of these complications are as follows:

1. Formation of pits and sebum plug pits where the fiber enters the scalp.
2. Between 20% and 50% of the artificial fibers will gradually fall out each year and have to be replaced to maintain hair density.
3. There are risks of foreign-body reaction, inflammatory reactions, and infections.
4. Over months to years, the artificial fibers tend to migrate short distances in the scalp and clump together into little clusters, looking not unlike small punch-grafts. These are much more likely to become infected than are isolated artificial hairs.
5. Breakage of the fiber can be a problem and is more common in some types of artificial fibers than with others. The Japanese Nido Z-type fiber is very resistant to breakage, but it will still occur with repeated rubbing or scratching by the patient [1].

Complications of AI have been treated mostly by manual removal of fibers and fiber-stubs with forceps and by scalp excisions and scalp flaps in extreme cases. It would be thought that all these patients who have suffered complications would prefer hair transplantation, but this is not always the case. Some prefer to have the troublesome artificial hairs removed and return to the semibald state. Dr. Shiell, in a personal communication with the author in 2008, commented that many others would request the insertion of more artificial fibers once the infection has subsided. The instantaneous nature of artificial hair implantation seems to have much appeal to these patients, and Shiell stated that he found it extremely difficult to convince them of the many advantages of hair transplantation.

When considering repair with hair transplantation, it is very important to first answer two questions during the initial assessment:
1. Whether infection or inflammation is still active at the recipient scalp.
2. Whether the patient agrees to remove the remaining fibers.

The fibers should be checked for any redness at the point of insertion, which is a sign of infection. The inflammation will usually subside with appropriate antibiotics, but when inflammation or infection is recurrent and persistent, all fibers must be removed. It is important however to obtain the patient’s consent to this intervention before proceeding. When there is no sign of infection, it is possible to perform hair transplantation satisfactorily with the artificial fibers in place.

Based on the answers to the two questions, the patient is then categorized into one of three groups.

**Group 1: Unhappy Patient Who Has Already Discontinued AI**

Remove the remaining fibers followed by hair transplantation in a single-stage procedure; this can be performed when the number of artificial fibers is small. If the number is considerable, the fibers should be removed in advance. The fibers are grasped by artery forceps and pulled very slowly along their exiting directions. The fibers are made of materials such as polybutylene, polyethylene, and nylon with different breakage points, and great care must be excised in removing the fibers lest the fiber breaks off inside the scalp. Punches of 0.75 mm or 1 mm are used to remove those fibers buried deep into the scalp that cannot be reached by the forceps.

After the fibers are removed, the surgeon can proceed immediately to hair transplantation. The overall technique is rather similar to transplanting into scar tissue (see the chapter, Cicatricial Alopecia in Hair Transplantation by Pathomvanich, in this volume) (Fig. 1a,b).

![Fig. 1. The repair of a group 1 patient. a. A 34-year-old man, Norwood class II. b At 2 years after one session of follicular unit transplantation (FUT) (750 grafts)](image)