Complications of Hair Transplant Procedures—Causes and Management

Anil Kumar Garg[1] Seema Garg[1]

[1] Rejuvenate Plastic Cosmetic & Hair Transplant Centre, Indore, Madhya Pradesh, India

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Address for correspondence Anil Kumar Garg, MS., MCh, MA(YOGA), APSI, ASI, ISHRS, WSRM, ISRM, AHRS·INDA, AAHRS, Rejuvenate Plastic Cosmetic & Hair transplant Centre, 2/1 RS. Bhandari Marg, Janjirwala Square, Indore, Madhya Pradesh, 452003, India (e-mail: anilgarg6l@yahoo.com).

Abstract

Hair transplant surgery per se has low risk, is relatively safe, and has minimum incidence of complications. However, it is a well-accepted fact that no medical science procedure exists without any potential risk of complications. The complication may be a single complaint in the form of pain, itching, dissatisfaction related to the procedure's outcome, or surgical complication in the form of infection, wound dehiscence or skin necrosis. Inadequate counselling increases unsatisfaction. Improper examination increases the complications, and incomplete medical history and history of allergy increases the risk during surgery.

The author collected data of his 2896 patients, operated over a period of 10 years, and recorded the complains and complications. The most common complications were sterile folliculitis, noted in 203 patients, vasovagal shock in seven patients of, hypertensive crisis in one patient, hiccups in six patients, facial edema after hair transplant in 18 patients, graft dislodgement in 8 patients, infection in two diabetic patients, minor necrotic patches in recipient area in three patients, keloid development in one patient, numbness in 18 cases, and hypersensitivity in recipient and/or donor area. Donor area effluvium was seen in one case and three patients showed recipient area effluvium. Twenty-six patients were not happy with the results, and five cases showed partial loss of implanted hair. The overall significant life-threatening or major complications were zero, but the total minor complications' percentage was 0.10%.

The key to minimize complaints and complications are detailed counselling, taking careful medical history and history of allergy, and proper examination of patients.

Keywords

- wound dehiscence
- necrosis
- scalp laxity
- telogen effluvium
- hypertensive crisis

Introduction

Hair transplant is a safe surgery but there can be some complications, which may be in the form of complaints like postoperative pain, itching, dissatisfaction related to the procedure's outcome, or surgical complications such as infection, wound dehiscence or skin necrosis.

The intraoperative complications,[1–3] which can occur in hair transplantation surgery, are anaphylactic shock, vasovagal shock, drug interactions, uncontrolled bleeding during strip harvesting, bronchospasm, or cardiac event. Although incidence of such events are negligible in hair transplantation, but every surgeon should know how to prevent and manage such life-threatening complications.

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Complications related to strip harvesting like inability to close a wound because of harvesting of wider strip or damage to principal neurovascular bundle, leading to severe bleeding, are infrequent. The overharvesting and harvesting of hair follicles beyond safe donor area are common technical errors during follicular unit extraction (FUE) harvesting. It is advisable to harvest FUE grafts uniformly from safe donor area only.

The chances of complaints and complications can be minimized by detailed counselling, taking proper medical history and history of allergy, and detailed examination of recipient and donor areas. The surgeon should be aware of all possible complaints and difficulties which may arise during or after surgery. The hair transplant surgeon should inform patients about possible complications.

Complaints

Surgical—pain, edema, itching, graft dislodgement, bleeding, folliculitis, hiccups.

Nonsurgical—patient dissatisfaction.

Complications

Intraoperative complications—anaphylactic shock, vasovagal shock, drug interactions, uncontrolled bleeding during strip harvesting, bronchospasm, or cardiac event.

Aesthetic complications—visible scarring, keloid, hypertrophic scar, donor and recipient area effluvium, poor results.

Other complications—infection, wound dehiscence, necrosis of skin, neuralgia, painful neuroma, arteriovenous fistula.

Incidence of Complaints and Complications

The author has recorded the incidence of complication and complaints out of 2896 patients operated during June 11, 2009, to November 30, 2020. There were no significant or life-threatening complications.

The author has observed hypertensive crisis in a patient during surgery. The patient was taking propranolol for his anxiety problems, and he did not inform the surgeon. Patient, as a routine, was given a local anesthetic with adrenaline, leading to hypertensive crisis. The author stopped the surgery, and after controlling of blood pressure, remaining grafts were implanted. Seven cases of the vasovagal problem were seen and managed. The author saw no other significant complications during surgery.

Postoperative facial edema was seen in 18 cases, which appeared to subside on its own on 6/7 postoperative day. Low incidence of edema in the author's series is probably due to postural advises to all patients and triamcinolone in tumescence fluid. Graft dislodgement in first 24 hours after surgery was seen in 8 patients. Six patients had hiccups, who were relieved with the help of tablet chlorpromazine 25 mg twice a day for 1 to 2 days. Sterile folliculitis was most the common problem, seen in 203 patients, which persisted from 3 weeks to 3 months of postoperative phase. Infection was seen in two diabetic patients, and minor necrotic patches in recipient area were observed in three patients, who were smokers, but the wounds healed by themselves. Numbness was seen in 18 cases, and hypersensitivity in recipient and/or donor area, which also subsided of its own within 2 to 3 weeks, but one patient out of 2896 patients had numbness in FUT-operated donor area for almost 4 months, which also recovered by its own. One patient developed keloid in the area over mastoid after strip harvesting and was treated by intralesional infiltration of triamcinolone acetate. Donor area effluvium was seen in one case and three patients showed recipient area effluvium. Out of three recipient area effluvium cases, one was female with unknown cause, and two were male patients with a history of fever 1 week before surgery. One female patient has minor necrosis in the FUT donor mastoid region because of the wound's tension closure. Twenty-six patients were not happy with the results because of loss of nontransplanted androgen-dependent hair, and five cases showed partial loss of implanted hair. Other studies done by Loganathan et al[4] observed complications in 4.7% of a total of 27 procedures, and Salanitri and others[5] observed complications in 13 of the 337 patients. All the above three studies showed that incidence of complications in hair transplant are not significant, and none of the authors demonstrated any life-threatening complications.

Pain

Pain is a common complaint in patients of strip surgery, but patients undergoing follicular unit excision may also complain of pain usually over donor area. There can be hypo and hyperesthesia in the donor area.[6,7]

Several analgesics like ibuprofen, acetaminophen, and tramadol are available and can be used. Postoperative infiltration of ropivacaine over strip harvesting area can significantly reduce the pain as well as fear of having the pain in linear excision surgery.[8]

Edema

Postoperative edema over the face appears on the third day of surgery, first, over the forehead and then upper eyelids, lower eyelids, and cheek. Pharmacological measures have a less role than nonpharmacological measures.

The postoperative edema can be reduced by the use of triamcinolone acetate in a tumescence solution.[9,10] The postoperative position of the patient also plays a role in facial edema, although a bit controversial. Usual recommendations are laying supine flat or slightly propped up position. Sleeping on one side or prone position should be avoided.[9]

Edema with pain and redness over donor area and recipient area, and face with or without fever, should be taken seriously, and immediate measures are warranted.

Anaphylaxis

Any patient who develops early swelling over the face with or without urticaria must be considered for an allergic reaction. There can be difficulty in breathing and hypotension. Common drugs used in the perioperative period which may cause allergic reactions are antibiotics, nonsteroidal anti-inflammatory drugs (NSAIDs), povidone iodine, neuromuscular blocking agents, etc. Allergic reactions to local anesthetics are extremely rare.[11,12]Antihistamines are drug of choice in acute urticaria. However, they are relatively slow acting. The anti-inflammatory effect of steroids helps in faster relief of symptoms.[12,13]

Itching

Postoperative itching is a common phenomenon over donor and recipient sites. Drying and crusting is the cause of this itching. Head wash from the third day and topical aloe vera or oil application help in effective control of itching.[2,14] The use of oral antihistamine plays a small role. If the itching remains uncontrolled, then a topical steroid solution can be advised for short period

Hiccups

Hiccups are an unusual complaint after hair transplant but may appear during or immediately after hair transplant.[14,15] The hiccups are because of the irritation of a phrenic nerve, which innervates the postauricular area. These nerves get irritated during strip harvesting, and FUE may cause hiccups. Routine ancillary treatment can solve the problem, and if not, then chlorpromazine 25 mg orally two to three times a day can be prescribed.

Postoperative Effluvium

The excessive hair loss of nontransplanted existing hair from the recipient area is commonly termed as shock loss or effluvium. The effluvium can be anagen or telogen.[2,14] The effluvium occurs mostly after 3 to 4 weeks after transplant. This effluvium can be because of direct trauma to existing hair follicles during slit creation, excessive edema, and vascular trauma while creating slits. The role of adrenaline in effluvium is not clear. Use of minoxidil solution helps in regrowth of hair but, otherwise, they also regrow after 3 to 4 months. A patient should be counselled about this, and female patients should be explained before transplant about the possibility of effluvium. The implanted hair usually falls within 3 to 4 weeks of implantation. This anagen effluvium is because of acute cut ff of vascular supply during the process of transplantation of donor hair follicles.

Folliculitis

Inflammation of follicles is called folliculitis. It is a response of an insult to follicles.[14] The triggering factors can be physical trauma or chemical irritation.[2,14] Noninfective folliculitis needs warm compression for 15 minutes for two to three times a day.

Inflammation with erythema, scattered pustules, and numerous cysts indicate the presence of infection. Such infections may need immediate intervention, intravenous (IV) antibiotics and, if necessary, hospital admission.

Dissatisfaction or Unhappy Patients

It is one of the most common complaints by patients. The dissatisfaction may be in terms of poor hair growth, unaesthetic hairline design, and loss of transplanted hair and hair growth in multiple directions. The poor growth is related to technical errors during the hair transplantation. Trauma to graft during the extraction, poor handling, graft desiccation, and long ischemia timing may result in poor hair transplant outcomes. Scalp show or inadequate coverage is related to the transplant of an insufficient number of hair follicles, poor planning, and poor outcome of transplanted hair. The decrease in density after transplant can be because of two reasons. The one more common is the loss of existing hair in due course of time in the area of transplant. The surgeon should explain this to the patient that transplant does not affect the survival of nontransplanted hair, and if a proper long-term medical treatment is not followed, there are all the chances of loss of these existing hair. Another reason for decreased density is the loss of transplanted hair, even after they might have grown after transplant. The loss of transplanted hair is mainly because the donor hair follicles were harvested from the unsafe donor area.

Poor aesthetic results may be due to the unaesthetic design of anterior hairline, poor planning, wrong direction, and angle of implantation of hair follicles. Male patients often ask for hairline of their teenage years, which means a low hairline and a curved frontotemporal area. The design of a low hairline demands a higher density of hair, and if planned at a young age, there are chances of loss of hair just behind the reconstructed hairline, giving very unnatural results. The use of multifollicular units in anterior hairline and wrong direction and angle of implantation of hair follicles gives a very unpleasant hair transplant result. Preoperative detail counselling in understanding the goals of patients and explaining the ability to meet them in terms of coverage, density, position of anterior hair line, need for medical treatment, and possibility of hair transplant in future will reduce the chances of dissatisfaction among patients.

Recipient Area Necrosis

The incidence of necrosis in the recipient area is significantly less. There is a dusky discoloration of the skin, followed by persistent crusting and an eschar. Finally, eschar detaches, leaving scarred alopecia patch. Technical contributing factors for the recipient bed's vascular compromise are vascular trauma during site creation and implantation, dense packing in unexperienced hands, and infiltration of excessive tumescence fluid with high adrenaline concentration. There are

Fig. 1 Showing necrosis of wound margin in postmastoid region, leading to dehiscence and healing by secondary intention, in a female patient operated by follicular unit transplantation (FUT).

systemic factors like long-standing uncontrolled diabetes, heavy smoking, and other factors compromising the circulation To avoid recipient area necrosis, stoppage of smoking, control of existing diseases, minimal trauma during site (slit) creation, avoidance of high concentration of adrenaline solution, and high-density implantation by an experienced hand will reduce chances of vascular compromise of recipient area. Use of oral low dose of aspirin or local application of nitroglycerin paste may help.[16]

Infection

Incidence of infection in hair transplant surgery is uncommon. Low incidence of infection does not allow surgeons and assistants to bypass necessary aseptic operation theater setup and surgery measures. No matter how invasive or minor the procedure is, it is recommended that all aseptic precautions should be taken as a rule.

Donor Area Wound Dehiscence and Necrosis

Wound dehiscence is not a common phenomenon in hair transplant surgery.[17–19] It is a sign of delayed healing or nonhealing. Excessive tension over the suture line may also cause wound dehiscence because of necrosis of skin margin (►**Fig. 1**).

Skin necrosis may also develop in FUE-harvested donor area if overharvesting is done in close proximity and/or there is use of poor-quality, large-size punch with high-revolution speed for harvesting follicles.

The minor wound needs dressing with topical antibiotic ointment; more extensive wound with necrosed skin might need debridement, dressing and, sometimes, secondary suturing.

Scar

A wide scar[20–22] on the backside is a cosmetically unacceptable sequel of the strip method of transplant surgery. A scar is a part of healing, but a wide scar may be result of the inadequate assessment of donor area and intrinsic property of individual skin. Younger patients have more chances of a wider scar than in elderly patients. ►**Fig. 2** shows a wide scar and ►**Fig. 3** shows wide atrophic scar in a case operated by FUT. Preoperative assessment of laxity, glidability and elasticity, and skin laxity exercises, can reduce the incidence of wide scarring. The donor hair follicles by FUE also creates scar in the form of "tiny dots," which are visible in a cleaned shaved head.

A wide scar can be managed by scar revision or hair transplant in the scar. Scalp micropigmentation is an excellent nonsurgical option to camouflage the scar (►**Fig. 4**).

Fig. 2 Wide follicular unit transplantation (FUT) donor scar.

Fig. 3 Atrophic wide follicular unit transplantation (FUT) donor scar.

Fig. 4 Follicular unit transplantation (FUT) scar treated by scalp micropigmentation

Hypertrophic Scar and Keloid

Keloid or hypertrophic scars (►**Fig. 5**) are the results of an exaggerated response to healing. The incidence of hypertrophic scar and keloid is a rare entity in hair transplantation. If it persists for a longer period and diverts patient's attention, then the local application of steroid ointment and/or moistening lotions are needed.[22]

Hypo or Hyperpigmentation

There can be hypo or hyperpigmentation of scar and or nearby areas of the donor site. It is more commonly seen in scars of FUE than scar of strip removal (►**Fig. 6**). Smaller good quality of sharp punch and avoidance of overharvesting can reduce the incidence of hypopigmentation of scars.

Neuralgia or Hypoesthesia

Any insult to underlying nerves during strip harvesting can give rise to neurological problems. Use of electrocautery in an attempt to coagulate vessels can injure nerves also. A partially injured nerve can create neuroma and cause pain or hyperesthesia at its region of innervations. A completely severed nerve gives hypoesthesia at its area of innervation. Deeper penetration of FUE punch can also induce trauma to the underlying nerves and may lead to neuralgia or burning sensation.

Fig. 5 This patient developed a keloid on one side of strip surgery along the suture line with complaints of itching, pain, and tenderness. Intralesion triamcinolone acetate injections treated him.

Fig. 6 Hypopigmentation of follicular unit extraction (FUE) scars.

Fig. 7 Donor area effluvium.

Minor forms of above symptoms subside within 6 to 8 weeks of surgery and need more counselling than treatment. Persistent neurological complaints need attention and management. Unresolved symptomatic neuroma may require exploration and excision of neuroma.[23]

Donor Hair Effluvium

Donor hair effluvium is a rare occurrence compared with recipient area effluvium. Accidental significant vascular damage, excessive suture line tension, smoking, and diabetes increase the chances of effluvium. In FUE cases, diffuse patches are observed near donor area, and in strip harvesting, it occurs along the incision line (►**Fig. 7**). The use of minoxidil accelerates hair regrowth. Repeated reassurance by surgeons is required to boost up the confidence of patients.

This patient was operated for follicular unit transplantation (FUT) and FUE. A total of 4500 grafts were taken over 2 days.

Conclusion

Most complications of hair transplant surgery are avoidable. A careful examination of the donor area and recipient area, and taking detailed history of the patient, can reduce complications.

History of medical illness, medication, tobacco, and smoking should be taken. Individual counselling and discussion before surgery helps in proper planning and avoids patient dissatisfaction.

Conflict of Interest
None declared.

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