Cranial Neurosurgery Without Removing Scalp Hairs

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ABSTRACT

Objective — *To find out rate of wound infection, difficulties encountered and patient's satisfaction with scalp hair preservation during cranial surgeries.*

Study design — *Descriptive case series.*

Place & Duration of study — *Ziauddin University Hospital Karachi Clifton campus, from January 2013 to June 2014.*

Methodology — *The hair cleaning and scrubbing procedure was done at the time of surgery with pyodine solution. Scalp shaving was not done. Routine surgical incision was made. Surgical wound was closed with a standard technique. Dressing was not applied. Exclusive traumatic lacerated extensive scalp wounds and cranioplasties cases were also included. Scalp hairs were shampooed postoperatively after 48 hours. The wounds were checked at outpatient follow-up on week 2, week 4 and then monthly for at least 3 months following discharge.*

Results — *A total of 86 patients were operated without shaving scalp hairs. There were 55 females and 31 male patients. Average age was 45.5 year. The procedures included were craniotomies for traumatic intracranial hematomas, tumors, hypertensive intracerebral hematomas, burr hole procedures for chronic subdural hematomas and placement of ventriculoperitoneal shunts. Technical difficulties were posed by very short and coarse hairs. Infection rate was less than 0.86%. All of the patients were happy and satisfied with their appearance after surgery .*

Conclusions — *Scalp hair preservation in cranial surgeries neither increased risk of postoperative wound infection nor made surgery difficult. The technique resulted in greater patients' satisfaction and good cosmetic outcome.*

Key words — *Scalp hair, Cranial surgery, Wound infection.*

INTRODUCTION:

Total or partial shaving of the scalp hairs has been a mandatory practice in cranial surgery since longtime. The main reason was to minimize postoperative wound infection- an observation that lacks authentic evidence.[1-4] With time this practice has been challenged and shave-less surgery has become the common practice among most of the neurosurgeons worldwide. Shave-less surgery causes minimal hindrance during surgery.[5-7] Shaving may increase the risk of infection rather than reducing it due to razor induced microtrauma of the scalp.[8-12] Surgery without shaving the scalp can also expedite the speed of rehabilitation due to less chances of postoperative psychological trauma.[12-14]

This study was conducted to find out the difficulty faced by the surgeons during surgery, postoperative wound infection, and patient's postoperative satisfaction with hair preservation in our clinical practices. This would be an evidence based data that may influence others in changing their approach to the patients in whom cranial surgery is indicated.

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METHODOLOGY:

This case series was conducted at the Department of Neurosurgery Ziauddin University Hospital Clifton campus, Karachi. Patients in whom cranial surgery was performed without shaving their scalp hairs were included. The study was carried out from January 2013 to June 2014. All types of elective and emergency surgical procedures were included. Male patients who shaved their heads within the follow-up period were excluded. Those patients who had very short hair which could not be tied were also excluded. The age, gender and surgical procedures performed, were recorded for all the patients. Primary outcome measures were difficulty faced at the time of surgery by the surgeon, postoperative patient's satisfaction and the wound infection.

At the time of induction of general anesthesia all patients received 01gram ceftriaxone and 500 mg amikacin intravenously. After the induction of general anesthesia and positioning the patient, the planned area of surgery was soaked with pyodine solution from top of the hair to the scalp base wearing sterilized surgical gloves. The solution was left for at least 10 minutes. The scalp in the incision area was exposed by parting the hairs with a regular comb and the hairs were fixed with rubber bands in multiple clumps. After scrubbing of the surgeons, the area of surgery was again soaked with pyodine and then the operative field was isolated with drapes and a local anesthetic (1% lidocaine with 1:100,000 epinephrine) was infiltrated into the incision site. Opsite (an adhesive transparent dressing) was applied over the surgical field area and then the incision area was cleared of Opsite for better visualization. The remaining Opsite held the loosened hair away from the field which usually slipped out from the hair bands.

The scalp incision was made with a regular scalpel followed by cutting diathermy. At the end of surgery wound was closed with polyglycolic acid sutures. Continuous suturing was used for galeal approximation followed by continuous suturing for the edges of the scalp to ensure proper hemostasis as well. A drain was regularly placed at the time of closure. At the end of operation, the hairs were rinsed with normal saline to remove the clots, dried with a clean towel, and the wound was covered with a thin film of pyodine paste and loose sterile gauze. Intravenous antibiotics were administered for at least three days after surgery.

On the 2nd postoperative day the gauze was removed and the hairs were shampooed. For next one week, patients were asked to squeeze an alcohol swab daily on the incision line. No dressings were required from 2nd day onward. Oral cefixime 400 mg once a day was continued for at least further seven days. The wounds were checked at outpatient follow-up, at 2nd and 4th week and then monthly for at least three months after discharge.

RESULTS:

A total of 86 patients were included. There were 55 female and 31 male patients. Average age was 45.5 year (range 16 year to 75 year). The procedures performed included craniotomies for traumatic intracranial hematomas (33.72%), tumors (27.90%) hypertensive intracerebral hematomas (16.27%), burr hole for chronic subdural hematomas (8.13%) and ventriculoperitoneal shunts (4.65%). Details are given in table I.

All of the patients were happy and satisfied with their appearance with great relief of not being bald postoperatively. Technical difficulties were posed by short and coarse hair especially in patients with prolonged surgeries. Time of wound closure ranged from 10 minutes to 30 minutes, which was not different from time taken by shaved scalp wounds. The absorbable sutures avoided the stitch removal procedure. Infection rate was 0.86%. A single case of superficial wound infection at the drain site with serous discharge was observed, which later on settled with frequent pyodine dressings and oral antibiotic for seven days.

DISCUSSION:

The results of this study were reasonably comparable with the world literature. Recently, this belief has become quite firm that scalp hair-shaving for cranial surgical procedures carries no scientific evidence and the significance of scalp shaving is nothing but a well established ritual which cannot prevent infection.[10,11] Generally it stimulates rapid rehabilitation and expedites the recovery to normal daily life, a fact which was common to our observation as well.

Preoperative preparation usually consists of shampooing within 24 hours before surgery and shampooing with chlorhexidine or a povidone-iodine solution on the operation table after anesthesia induction. We did not shampoo in the operating room, or a night before, rather, we just soaked the suggested surgical site with pyodine solution and left it at least for 10 to 15 minutes prior to toweling and then repeating the same after scrubbing of the surgeon.

Table I: Surgical Procedures Performed

Surgical Procedures	Number of Patients	
	Percentage	Number
Head trauma surgeries (epidural hematomas, acute subdural hematomas, massive contusions, decompressive craniectomies)	33.72%	29
Craniotomies for tumors	27.90%	24
Craniotomies for spontaneous intracerebral hematomas	16.27%	14
Burr holes for chronic subdural hematomas	8.13%	07
Ventriculoperitoneal shunts	4.65%	04
Traumatic lacerated extensive scalp wounds	5.81%	05
Cranioplasties	3.48%	03

The techniques used to avoid the interference of hair with surgical procedures include fixing the hair with adhesive tape, rubber bands with chlorhexidine jelly, staples to the hair and braiding at the wound margins to prevent hair from getting into the wound.[15-17] We simply placed sterilized rubber bands on the hair parted with a comb.

The electrosurgical scalpel, primarily intended for fine aesthetic surgery is an excellent tool for incising the scalp and for soft tissue dissection causing minimal blood loss and facilitates rapid wound healing.[18] We used the regular steel scalpel followed by cutting mode monopolar diathermy. Some studies employed a similar preparation and documented closure time for both shaved and unshaved scalps.[14] In some studies depending on the size of the skin incision, wound closure took 20–30 minutes longer than in shaved patients.[15]

Hair clipping rather than shaving with traditional blades can also reduce risk of wound infection. According to some studies, the risk of wound infection is similar with or without shaving.[3] Multiple randomized and retrospective studies showed that hair removal before an operation did not decrease and in fact may increase the risk of wound infection.[19,20] The reported wound infection rate after cranial surgery without hair removal is around 1% (range 0–8.3%). In our study, infection rate was less than 1% (0.86%). The reason may be a longer duration antibiotic cover (three days intravenous followed by one week oral). The limitations of our study included the fact that it was an uncontrolled, nonrandomized study with small number of patients.

CONCLUSIONS:

The presence of hair in the operative field did not increase the risk of postoperative wound infection in cranial surgeries neither it posed any difficulty for the surgeon during surgery. Hair-saving surgeries had considerable cosmetic value for the patient as it avoid psychological trauma.

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