Modified Draping to Avoid Fluid Leakage in Cranial Surgery
—Technical Note—

Satoru SHIMIZU*,**, Takahiro MOCHIZUKI*,**, Kenji NAKAYAMA*, and Kiyotaka FUJII**

*Department of Neurosurgery, General Ohta Hospital, Ohta, Gunma; **Department of Neurosurgery, Kitasato University School of Medicine, Sagamihara, Kanagawa

Abstract
Contamination under draping due to leakage of fluid from the surgical field should be avoided to maintain cleanliness. A modified draping method was developed using standard draping materials but with an irrigation pouch applied directly to the scalp. The present method prevents fluid leakage along the scalp, increases surgeon comfort, and reduces postoperative room cleaning.

Key words: cranial surgery, draping, irrigation

Introduction
Leakage of blood and fluid from the surgical field may contaminate other parts of the patient's body, the surgeon, and the operating room. Careful drainage of fluid without leakage is especially important in cranial surgery, which often requires abundant irrigation. Fluid leakage may be experienced with current standard approaches with irrigation pouches attached to the drape sheets, but this problem has not received sufficient attention. We present a method to avoid this situation.

Surgical Technique
After head positioning and preparation of the scalp (shaving, sterilization, and dry up), an irrigation pouch with adhesive is directly applied to the scalp, to catch fluid from the surgical field. Either a separate irrigation pouch or U-shaped disposable linen with an irrigation pouch can be used. Next, a strip of plastic drape (reinforcement tape) with a width of about 5 cm is adhered tightly overlying the scalp and the upper margin of the pouch. The margin of the pouch should be placed at a sufficient distance from the incision site to obtain a greater adhesion area of the tapes to the scalp, and to ensure water sealing. Linen is then placed around the surgical field, and finally a sheet of plastic drape is applied. The plastic drape is adhered tightly as usual at the incision site, only adhered lightly over the reinforcement tape to allow any fluid passing under the drape sheet to flow into the pouch without peeling the tape off from the scalp. Components of this draping scheme are shown in Fig. 1.

During surgery, drainage catheters should be lead not distal to the tape to preserve the water sealing effect.

Discussion
Migration of fluid under drape sheets might be prevented by application of a scalp clip to the drape sheet and the scalp together.1) However, application or removal of the clip may be required to permit the migration of fluid at incision sites, despite careful preoperative draping. Exit sites of drainage catheters may also permit migration. Therefore, current standard draping with the irrigation pouch attached to the drape sheet cannot easily maintain fluid drainage without leakage.

Pathways of migrating fluid with the standard and
the present modified draping methods are shown in Fig. 2. Fluid flows under the drape sheet with the modified method, as with the standard one, but the reinforcement tape leads the fluid into the pouch without leakage.

Our experience shows that this method provides complete water sealing except in narrow or wet areas to adhere the reinforcement tapes on the scalp, such as just anterior to the auricle with preauricular scalp incisions or injured scalp covered with blood or exudation. Tape of more than 2 cm width on the dry shaved scalp was needed to achieve the effect. This method was applied to only cases with total hair removal in our study, but application will be possible with minimally extended partial hair removal. The efficacy has not yet been confirmed in surgery for long durations of more than about 10 hours. No infections or other problems related to the procedure have been experienced. Although restrictions of application and the somewhat complicated procedure are problems, the present method also increases the surgeon's comfort during surgery and reduces postoperative room cleaning. Further improvements of draping products and methods are expected.

Reference


Address reprint requests to: S. Shimizu, M.D., Department of Neurosurgery, International Goodwill Hospital, 1–28–1 Nishigaoka, Izumi-ku, Yokohama, Kanagawa 245–0006, Japan.

Commentary on this paper appears on the next page.
Commentary

The authors present a modified method for waterproof draping of the operative field. Their method is similar to that used in many centers where adhesive plastic drape is applied to the scalp. The plastic drape holds a sterile plastic pouch that collects surgical debris. We agree with the authors that the adhesive plastic drape has the tendency to come loose and detach from the scalp in some instances. The use of a reinforcement tape might prove helpful in minimizing the problem. Nevertheless it is our belief that the adhesiveness of the material to the skin could be improved with careful removal of the skin’s oiliness with products such as ether or similar.

Feres Chaddad Neto, M.D.
and Evandro de Oliveira, M.D.
Instituto de Ciências Neurológicas
São Paulo, Brazil

This is a nice draping technique for craniotomies described by the authors. It allows controlled drainage of irrigation fluid from the wound in order to prevent saturation of the surrounding drapes and also soiling of the floor. The only shortcoming that I see with this method is instances when the hair of the patient is not shaved. Often these days we perform more and more operations without shaving the patient’s head. Several papers have described the safety of such techniques. With the hair in place it is very difficult to place occlusive drapes as described in this paper. We staple towels to the edge of the proposed craniotomy and then place occlusive drapes and the drainage bag on top of it all. I believe we all have our favorite methods of draping to solve our individual problems and the ideas of this paper are useful additions.

Chandranath Sen, M.D.
St. Luke’s Roosevelt Hospital Center
New York, New York, U.S.A.