

## Original Article

## Skin closure in vascular neurosurgery: A prospective study on absorbable intradermal suture versus nonabsorbable suture

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Received: 20 June 12

Accepted: 06 July 12

Published: 21 August 12

**This article may be cited as:**

Pereira JL, Vieira G, Freitas de Albuquerque LA, Mendes GC, Salles LR, Ferreira de Souza AF, et al. Skin closure in vascular neurosurgery: A prospective study on absorbable intradermal suture versus nonabsorbable suture. *Surg Neurol Int* 2012;3:94.

Available FREE in open access from: <http://www.surgicalneurologyint.com/text.asp?2012/3/1/94/99941>

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### Abstract

**Background:** The craniotomy performed with minimal hair removal and closure with intradermal suture alone is an option in neurosurgical procedures, which can help faster psychological recovery of the patient, as it allows a better cosmetic result. This study is aimed at evaluating if such method is safe and effective, compared with continuous skin sutures with 2-0 nylon.

**Methods:** We analyzed the sutures in 117 patients undergoing craniotomies for cerebral aneurysm clipping. In the case group ( $n = 49$ ), closure of the scalp was performed only with intradermal absorbable sutures using wire Monocryl® 2-0. In the control group ( $n = 68$ ), closure was performed with continuous suture using 2-0 nylon.

**Results:** The case group was composed of 49 patients in whom just intradermal suture was performed. One (2.2%) patient developed wound infection and was given proper medical treatment. No cases of dehiscence or cerebrospinal fluid leaks were observed. The control group was composed of 68 patients in whom the skin was closed with 2-0 nylon continuous suture. Three (5.3%) patients developed wound infection and were given proper medical treatment. There were no cases of wound dehiscence. The overall infection rate in the control group was 4%. There was no statistically significant difference in the number of wound infections between the two groups ( $P = 0.73$ ).

**Conclusion:** The closure with intradermal suture alone in craniotomies is as safe as the traditional skin closure with nylon sutures, besides eliminating the need for suture removal and providing a cosmetic advantage.

**Key Words:** Intracranial aneurysm, intradermal suture, skin closure

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Website:  
[www.surgicalneurologyint.com](http://www.surgicalneurologyint.com)

DOI:  
10.4103/2152-7806.99941

**Quick Response Code:**

## INTRODUCTION

Neurosurgical procedures lead to great psychological stress. In the past decade, several strategies and techniques have been implemented in order to minimize the patient's emotional stress.<sup>[1,2]</sup> The esthetic aspect, not considered so important in the past, is now an important feature in the recovery and the quality of life in the postoperative period.<sup>[1,3,5,8]</sup>

Minimal trichotomy techniques have been widely used, having proved to help in the psychological recovery of the patient and to be efficient and safe.<sup>[2,4-7]</sup>

However, the majority of neurosurgeons in the world continue to use skin sutures and there have been few works published on the use of intradermal suture alone combined with minimal trichotomy, in craniotomies.<sup>[9]</sup> This technique can be helpful as there is no need for the removal of the suture and there is immediate esthetic improvement after surgery.<sup>[9,10]</sup>

This study is aimed at demonstrating that intradermal suture alone in craniotomies is a safe and efficient method in vascular microsurgeries, based on the comparison with skin sutures with 2-0 nylon.

## MATERIALS AND METHODS

A prospective study was carried out between January 2009 and October 2010 at Santa Casa Hospital in Belo Horizonte.

A total of 117 patients underwent craniotomies for cerebral aneurysm clipping. Seventeen were excluded from the study as they evolved to death during the treatment. All the remaining 100 patients followed the same protocol, except for the suture technique, and were thus being divided into two groups: case and control. At surgery, a minimal trichotomy was performed in both groups, just along the incision, followed by degermation with chlorhexidine for 5 min and then with alcoholic chlorhexidine. Antibiotic prophylaxis with cefazolin, before skin incision, was performed. No subgaleal drainage was used. Wound was assessed 3 and 30 days in the postoperative period. Washing of the hair and wound was recommended 48 h after surgery.

In the case group, the closing of the scalp was performed just with absorbable intradermal continuous sutures with 2-0 Monocryl® in 44 consecutive patients [Figure 1]. In the control group, the closing procedure was by using continuous sutures with 2-0 nylon in 56 consecutive patients.

At all assessments, the surgical wound was visually inspected for signs of infection, dehiscence, fistulas, and/or other complications.



**Figure 1: Appearance of skin wound 7 days after surgery**

## RESULTS

A total of 117 patients were divided into two groups. The case group consisted of 49 patients in whom only the intradermal suture was performed. Twelve were cases of ruptured aneurysms and 37 were unruptured aneurysms. Five evolved to death during the treatment and were excluded from the study. The average of age was 50.93 years (youngest = 24 years and oldest = 85 years; SD = 13.6). In this group, 14 patients were males (31.8%) and 30 were females (69.1%). One patient (2.2%) developed an infection in the surgical wound, with good response with the use of oral antibiotic. There were no cases of dehiscence or of cerebrospinal fluid fistula, and no allergic reaction to the material used was detected. So, good healing of the surgical wound was observed in all the other patients.

The control group consisted of 68 patients in whom the skin was closed with 2-0 nylon. All of them were cases of ruptured aneurysms (100%). Twelve patients (17.6%) evolved to death and were excluded from the study. Age average was 47.12 years (youngest = 14 years and oldest = 76 years; SD = 11.7). In this group, 16 patients (28.5%) were males and 40 were females (71.4%). Three (5.3%) developed an infection in the surgical wound, with posterior good clinical treatment outcome. There were no cases of dehiscence, and good healing of the surgical wound was observed in all the other patients.

The infection rate in the whole study was 4%, and there was no significant statistical difference between the two groups concerning wound infection ( $P = 0.73$ ).

## DISCUSSION

The cosmetic aspect has been lately valued in surgical procedures even when it is a high complexity surgery.<sup>[11,14]</sup> Several surgical specialties have reported the use of

intra-dermal sutures for epidermal closure with good esthetic results and patient satisfaction.<sup>[11-14]</sup>

In neurosurgery, there are few reports describing intra-dermal closure. In 2008, Paolini *et al.* reported the daily use of intra-dermal suture for elective craniotomies, showing that it was a safe and efficient method in 208 patients who had undergone neurosurgery for several different diseases. Complication rates were very low: one case of cerebrospinal fluid fistula and one case of surgical wound infection.<sup>[9]</sup>

In the present study also, we had a low rate of complications in the two groups: 2.2% in the intra-dermal closure group and 5.3% with the 2-0 nylon procedure, with no significant statistical difference.

## CONCLUSION

As our results point to no significant statistical difference between intra-dermal suture alone and the closing of the skin with 2-0 nylon in regards to complications in wound healing, due to the esthetic advantage and comfort of the patient, we suggest the intra-dermal method alone as a routine in craniotomies.

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