

Cutaneous Surgery in Patients on Warfarin Therapy

Justin K. Nelms, MD, Anna I. Wooten, MD, and Frederick Heckler, MD

Abstract: Warfarin is a commonly used anticoagulant for patients with prosthetic heart valves, atrial fibrillation, stroke, deep vein thrombosis, or pulmonary emboli to prevent thromboembolic events. There is no clear consensus regarding the perioperative management of warfarin therapy for plastic surgery procedures. Our objective is to evaluate the safety and quantify any increased morbidity in patients on warfarin therapy, undergoing soft tissue surgery.

In a retrospective chart review of prospectively collected data, patients undergoing cutaneous surgery on warfarin therapy from 2000 to 2006 were identified. Perioperative complications were evaluated, including major hemorrhage, incisional bleeding, hematoma, wound or flap complications, graft success, and cosmetic surgical outcome. A total of 26 anticoagulated patients who underwent 56 procedures were included. Intraoperative bleeding was controlled in all cases without difficulty. Minor postoperative bleeding was noted in 1 patient, and this was easily controlled with gentle pressure. All wounds healed without complication, including 2 split thickness skin grafts. The cosmesis of all scars was acceptable.

Anticoagulation with warfarin can be safely continued in patients undergoing minor soft tissue procedures, thereby avoiding the risk of potentially devastating thromboembolic events.

Key Words: cutaneous surgery, warfarin

(*Ann Plast Surg* 2009;62: 275–277)

Perioperative management of the anticoagulated patient poses a dilemma to the surgeon. Concerns regarding intraoperative or postoperative bleeding must be carefully weighed against the potentially devastating consequences of a thromboembolic event. Warfarin is the most commonly prescribed anticoagulant for the prevention and treatment of thromboembolism. Studies from the dermatologic literature estimate that warfarin is used in 1.5% to 3.7% of patients undergoing soft tissue surgery.^{1,2} The perioperative cessation of warfarin carries an increased risk of adverse thromboembolic events because of the thrombogenic nature of surgery. It has also been suggested that a potential hypercoagulable state may result from a rebound increase in clotting factors after warfarin is discontinued.³

Despite the fact that more than 2 million patients are on warfarin in North America,⁴ no clear consensus exists in the plastic surgery literature regarding perioperative management. Previous studies in the disciplines of dermatology,^{1,5–8} dental surgery,^{9–11} ophthalmology,¹² urology,¹³ orthopedic surgery,¹⁴ and general surgery¹⁵ have suggested that continuing warfarin therapy is safe for minor procedures; however, only a few of these included controlled trials. Certain aspects of cutaneous surgery make it less troublesome than more invasive procedures with respect to risk of hemorrhage.

Intraoperative and postoperative bleeding is easily identified, and relatively easy to control with epinephrine, electrocautery, or pressure.

There have been a number of studies examining the incidence of thromboembolic complications when warfarin is electively discontinued preoperatively. In a recent survey of 168 cutaneous surgeons, 46 patients were reported to have had thrombotic events when anticoagulants were discontinued.⁷ A recent review of the literature estimated the risk of thrombosis in patients discontinuing warfarin perioperatively between 1 per 278 and 1 per 1250 procedures.¹⁶ Although rare, these thromboembolic events are potentially devastating, and may be avoided if anticoagulation can be safely continued in the perioperative period. The aim of our review was to quantify any increased risk of hemorrhagic or other related complications involved in minor soft tissue plastic surgery procedures on patients anticoagulated with warfarin.

CASE REPORT

A 78-year-old man presented to our clinic for management of a squamous cell carcinoma on his cheek. The patient had chronic atrial fibrillation, for which he was anticoagulated with warfarin. His anticoagulation was reversed during the perioperative period by his cardiologist, and no bridging therapy with heparin was used. The surgery was uneventful, and the patient resumed his warfarin on postoperative day zero. He was discharged with his cardiologist supervising his anticoagulation. Two days after discharge, the patient suffered a severe acute thromboembolic stroke, eventually resulting in his demise. This event evoked a change in our own practice regarding perioperative anticoagulation. After carefully reviewing the literature, we decided not to withhold anticoagulation for patients on warfarin therapy who undergo cutaneous surgery. Six years later, we reviewed our data.

PATIENTS AND METHODS

We retrospectively reviewed 518 charts from the private offices of the senior author (F.R.H.) at Allegheny General Hospital in Pittsburgh, PA. The records were reviewed dated from 2000 to 2006. Patients who remained on warfarin therapy perioperatively for cutaneous surgery by a single attending were included. Twenty-six patients undergoing 56 procedures were identified, and data were collected with regard to the procedure performed, type of lesion, area of excision, method of closure, and the occurrence of any intraoperative or postoperative complications. Excluded from the study were those patients found to be on multiple anticoagulants (ie, aspirin, clopidogrel, or heparin). Prothrombin times and bleeding times were not evaluated preoperatively, and warfarin dosages were not altered from each patient's primary care physician's orders, so as not to interrupt what they judged to be appropriate antithrombotic levels.

RESULTS

Twenty-six patients were included in the study. Sixteen were men and 10 were women. Ages ranged from 60 to 98 with a mean age of 78. The indications for surgery included basal cell carcinoma (n = 28), squamous cell carcinoma (n = 19), melanoma (n = 1), dysplastic nevi (n = 2), and keratoacanthoma (n = 1). The location

Received January 15, 2008, and accepted for publication, after revision, April 15, 2008.

From the Division of Plastic and Reconstructive Surgery, Allegheny General Hospital, Pittsburgh, PA.

Reprints: Justin Nelms, MD, 2816 Larkins Way, Pittsburgh, PA 15203. E-mail: jnelms24@yahoo.com.

Copyright © 2009 by Lippincott Williams & Wilkins

ISSN: 0148-7043/09/6203-0275

DOI: 10.1097/SAP.0b013e31817d822f

TABLE 1. Profile of Patients Receiving Warfarin Therapy

Age/Sex	Lesion/Location	Excision	Closure Type
81 y/M	SCCA temple	28 × 12 mm	Primary closure
	BCCA nose	22 × 3 mm	Left open
	SCCA nose, cheek		Primary closure
72 y/M	SCCA forehead	32 × 12 mm	Primary closure
78 y/M	BCCA temple	28 × 13 mm	Primary closure
65 y/M	SCCA L ear	32 × 7 mm	Primary closure
	SCCA R ear	31 × 20 mm	Local flap
98 y/F	Lymphoepithelioma L cheek	25 × 25 mm	Local flap
	Recurrence	15 × 10 mm	Local flap
	KAC forehead	37 × 19 mm	Primary closure
80 y/M	BCCA scalp/curretage	Currete	Desiccation curretage
	BCCA forehead	15 × 6 mm	Primary closure
	BCCA L preauricular area	5 × 10 mm	Primary closure
	BCCA shoulder/chest/leg	27 × 25 mm	Primary closure
69 y/F	BCCA periorbital	30 × 15 mm	Local flap
	BCCA scalp, malar area	25 × 10 mm	Primary closure
	BCCA malar area	15 × 14 mm	Primary closure
	BCCA cheek, KAC hand	30 × 15 mm	Primary closure
75 y/M	BCCA L elbow	26 × 13 mm	Primary closure
84 y/M	SCCA forehead	32 × 14 mm	Primary closure
68 y/M	BCCA ear	2 × 2 cm	FTSG
83 y/F	BCCA nose	21 × 17 mm	FTSG
60 y/F	SCCA lip	13 × 5 mm	Primary closure
75 y/M	BCCA nasolabial fold	12 × 7 mm	Primary closure
76 y/F	BCCA forehead	20 × 10 mm	Local flap
70 y/M	BCCA nose	25 × 15 mm	Primary closure
	Recurrent BCCA nose	28 × 11 mm	Primary closure
77 y/F	BCCA nose	12 × 10 mm	Local flap
76 y/M	BCCA scalp	20 × 11 mm	Primary closure
	Solar keratosis	15 × 7 mm	Primary closure
	BCCA scalp	17 × 9 mm	Primary closure
	BCCA scalp	17 × 11 mm	Primary closure
	BCCA preauricular area	19 × 10 mm	Primary closure
64 y/M	SCCA chest	41 × 20 mm	Primary closure
	SCCA neck	70 × 20 mm	Primary closure
	SCCA back	30 × 24 mm	Primary closure
	SCCA chest	15 × 10 mm	Primary closure
	SCCA neck	15 × 10 mm	Primary closure
	SCCA lower chest	30 × 20 mm	Primary closure
	BCCA postauricular area	22 × 22 mm	Local flap
75 y/F	SCCA L cheek	30 × 15 mm	Primary closure
93 y/M	BCCA upper back	30 × 21 mm	Primary closure
78 y/M	SCCA hand	35 × 15 mm	Primary closure
	SCCA L cheek R forearm	28 × 13 mm	Primary closure
		30 × 16 mm	Primary closure
72 y/F	SCCA nailplate	12 × 7 mm	Left open

(Continued)

TABLE 1. (Continued)

Age/Sex	Lesion/Location	Excision	Closure Type
65 y/M	s/p melanoma, keloid scar	8 × 7 mm	Primary closure
83 y/M	BCCA forehead nose	15 × 7 mm	Primary closure
		20 × 25 mm	Local flap
81 y/F	BCCA R cheek,	3.5 × 2.5 cm	Primary closure
	BCCA chest	1.5 × 2.5 cm	Primary closure
	SCCA L malar area	23 × 10 mm	Primary closure
	AK L arm	26 × 15 mm	Primary closure
72 y/F	BCCA forehead	18 × 10 mm	Primary closure

AK indicates actinic keratosis; BCCA, basal cell carcinoma; FTSG, full thickness skin graft; KAC, keratoacanthoma; L, left; R, right; SCCA, squamous cell carcinoma.

and size of the excision were recorded. This data is summarized in Table 1.

Meticulous hemostasis was employed intraoperatively. Most of the wounds were closed by primary closure (n = 41) in 2 layers using absorbable suture in the deep dermis. Local flaps (including V-Y advancement, rotational, bilobed, and Lindberg) were used in some cases (27%), and 2 wounds were reconstructed by split thickness skin graft. Postoperatively, a pressure dressing was applied, and the patients were monitored for any hemorrhagic complications, both immediately postoperative, and at their 1 week follow-up appointment. Endpoints assessed included bleeding, hematoma, wound complications, and skin graft success.

No patient exhibited any major hemorrhagic complications in the intraoperative or postoperative period. Specifically, no subjective difference in bleeding was noticed intraoperatively compared with patients not on warfarin therapy. One patient experienced a minor complication involving oozing from the incision at 1-week postoperatively, and this was easily controlled with gentle pressure. No other patients reported bleeding in the days after the surgery, nor were any complications noted at the postoperative follow-up visit. The cosmetic outcome was acceptable in every case. Both skin grafts included in the study were successful.

DISCUSSION

The management of perioperative anticoagulation can be a complex issue, and is a relatively common dilemma encountered by the plastic surgeon, facing an aging population. Data supporting the safety of continuing warfarin therapy for minor procedures exist in the dermatology, ophthalmology, urology, and dental surgery literature. The treatment for most indications for anticoagulation (ie, cardiac valve prosthesis, valvular heart disease, atrial fibrillation, or patients who have had a stroke) targets an international normalized ratio (INR) of 2.5. Most authors recommend careful attention to the patient's INR, the consensus being that a level of less than 3.5 is relatively safe for minor surgery. A patient's risk of bleeding increases substantially once the INR exceeds 5.^{17,18} The cessation of warfarin therapy carries a risk of potentially devastating complications, even when bridging therapy is used.

Our study did not include a control group; however the minor complication incidence in our group (1.8%) was comparable to previously published controls (1.4%).^{2,8}

Although our cohort is not sufficiently powered to draw any definitive conclusions, our results suggest that electing not to withhold anticoagulation is safe for superficial soft tissue surgery. To our knowledge, this is the largest study to date evaluating this issue in the plastic surgery literature. A large, prospective, randomized controlled trial will be necessary to provide definitive data with

regard to the management of anticoagulation in the plastic surgery patient.

REFERENCES

- Alcalay J. Cutaneous surgery in patients receiving warfarin therapy. *Dermatol Surg.* 2001;27:756.
- Billingsley EM, Maloney ME. Intraoperative and postoperative bleeding complications in patients taking warfarin, aspirin, and nonsteroidal anti-inflammatory agents: a prospective study. *Dermatol Surg.* 1997;23:381.
- Genewein U, Haeberli A, Straub PW, et al. Rebound after cessation of oral anticoagulant therapy: the biochemical evidence. *Br J Haematol.* 1996;92:479.
- Waterman AD, Banet G, Milligan PE, et al. Patient and physician satisfaction with a telephone-based anticoagulation service. *J Gen Intern Med.* 2001;16:460–463.
- Alcalay J, Alcalay R. Controversies in perioperative management of blood thinners in dermatologic surgery: continue or discontinue? *Dermatol Surg.* 2004;30:8.
- Otley CC. Continuation of medically necessary aspirin and warfarin during cutaneous surgery. *Mayo Clin Proc.* 2003;78:1392–1396.
- Kovich O, Otley C. Thrombotic complications related to discontinuation of warfarin and aspirin therapy perioperatively for cutaneous operation. *J Am Acad Dermatol.* 2003;48:233–237.
- Otley CC, Fewkes JL, Frank W, et al. Complications of cutaneous surgery in patients who are taking warfarin, aspirin, or nonsteroidal anti-inflammatory drugs. *Arch Dermatol.* 1996;132:161–166.
- Campbell JH, Alvarado F, Murray RA. Anticoagulation and minor oral surgery: should the anticoagulation regimen be altered? *J Oral Maxillofac Surg.* 2000;58:131–135.
- Cannon PD, Dharma VT. Minor oral surgical procedures in patients on oral anticoagulants—a controlled study. *Aus Dental J.* 2003;48:2.
- Wahl M. Dental surgery in anticoagulated patients. *Arch Intern Med.* 1998;158:1610–1616.
- McCormack P, Simcock PR, Tullo AB. Management of the anticoagulated patient for ophthalmic surgery. *Eye.* 1993;7:749–750.
- Parr NJ, Loh CS, Desmond AD. Transurethral resection of the prostate and bladder tumour without withdrawal of warfarin therapy. *Br J Urol.* 1989;64:623–625.
- Thumboo J, O'Duffy JD. A prospective study of the safety of joint and soft tissue aspirations and injections in patients taking warfarin sodium. *Arthritis Rheum.* 1998;41:736–739.
- McLemore EC, Harold KL, Cha SS, et al. The safety of open inguinal herniorrhaphy in patients on chronic warfarin therapy. *Am J Surg.* 2006;192:860–864.
- Spandorfer J. The management of anticoagulation before and after procedures. *Med Clin North Am.* 2001;85:1109–1116.
- Hirsh J, Dalen JE, Anderson DR, et al. Oral anticoagulants: mechanism of action, clinical effectiveness, and optimal therapeutic range. *Chest.* 1998;114:445S–469S.
- Gallus AS, Baker RI, Chong BH, et al. Consensus guidelines for warfarin therapy. Recommendations from the Australian Society of Thrombosis and Hemostasis. *Med J Aust.* 2000;172:600–605.