

## Should aspirin be stopped before carpal tunnel surgery? A prospective study

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### Abstract

**AIM:** To determine whether patients taking aspirin during carpal tunnel release had an increase of complications.

**METHODS:** Between January 2008 and January 2010, 150 patients underwent standard open carpal tunnel release (CTR) under intravenous regional anaesthesia. They were divided into three groups: groups 1 and 2 were made of 50 patients each, on aspirin 100 mg/d for at least a year. In group 1 the aspirin was never stopped. In group 2 it was stopped at least 5 d before surgery and resumed 3 d after. Group 3 acted as a control, with 50 patients who did not take aspirin. The incidence of clinically significant per- or post-operative complications was recorded and divided into local and cardio-cerebro-vascular complications. Local complications were then divided into minor and major according to Page and Stern. Local haematomas were assessed at 2 d (before resuming aspirin in group 2) and 14 d (after resuming aspirin in group 2) postoperatively. Patients were reviewed at 2, 14 and 90 d after surgery.

**RESULTS:** There was no significant difference in the

incidence of complications in the three groups. A total of 3 complications (2 major and 1 minor) and 27 visible haematomas were recorded. Two major complications were observed respectively in group 1 (non stop aspirin) and in group 3 (never antiaggregated). The minor complication, observed in one patient of group 2 (stop aspirin), consisted of a wound dehiscence, which only led to delayed healing. All haematomas were observed in the first 48 h, no haematoma lasted for more than 2 wk and all resolved spontaneously. A major haematoma (score > 20 cm<sup>2</sup>) was observed in 8 patients. A minor haematoma (score < 20 cm<sup>2</sup>) was recorded in 19 patients. All patients at 90 d after surgery were satisfied with the result in terms of relief of their preoperative symptoms. Major and minor haematomas did not impair hand function or require any specific therapy.

**CONCLUSION:** Our study demonstrates that continuation of aspirin did not increase the risk of complications. It is unnecessary to stop aspirin before CTR with good surgical techniques.

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**Key words:** Carpal tunnel syndrome; Aspirin; Antiaggregation therapy; Hand surgery; Carpal tunnel release

**Core tip:** Our study demonstrates that continuation of aspirin did not increase the risk of local or general complications. Continuation of aspirin did not influence the subjective scar assessment. It is concluded that it is unnecessary to stop aspirin before carpal tunnel release when good meticulous surgical techniques are used.

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## INTRODUCTION

Antiplatelet agents, such as aspirin and thienopyridines (clopidogrel and ticlopidin), reduce the risk of vascular death by about one sixth and the risk of non-fatal myocardial infarction and stroke by about one third in patients with unstable angina or a past history of myocardial disease, according to a meta analysis of several randomized studies<sup>[1-5]</sup>. Low-dose aspirin may however increase bleeding complications when taken preoperatively or during certain diagnostic procedures such as gastroscopy and bronchoscopy, especially in conjunction with biopsies<sup>[1,6]</sup>. Therefore, there is a need to balance the risk of haemorrhagic complications when continuing anti-aggregation therapy against the risk of thrombotic complications when interrupting it<sup>[7-12]</sup>. The aim of this prospective study was to determine the effect of interrupting or continuing antiplatelet therapy in open carpal tunnel.

## MATERIALS AND METHODS

We carried out carpal tunnel release (CTR) on 150 patients between January 2008 and January 2010 with a 90-day follow-up. They were divided into three groups: (1) group 1: 50 patients taking 100 mg of aspirin/d for at least one year. These patients did not interrupt the anti-aggregation; (2) group 2: 50 patients taking 100 mg of aspirin/d for at least one year. In this group, aspirin was withdrawn in agreement with the cardiologist for at least 5 d before surgery and was resumed 3 d post-operatively, as described in several studies<sup>[7,13-16]</sup>; and (3) group 3: 50 patients who were not anti-aggregated.

Inclusion criteria were: age between 50 and 75, symptomatic, unilateral and electrophysiologically confirmed carpal tunnel syndrome. We excluded patients undergoing simultaneous surgical procedures (*e.g.*, trigger finger), those with known haematological disorders (*e.g.*, haemophilia) or with severe heart disease. No routine pre-operative blood tests were performed. The standard surgical management in all cases consisted of intravenous regional anaesthesia (IVRA) with a tourniquet applied at mid-arm level inflated at 250 mmHg. No post-operative splints or drains were used and 90 mg of acetaminophen were administered twice a day during 48 h. All patients were followed-up in our outpatient clinic on day 2, 14 and 90 after surgery, for a subjective and objective wound assessment and neurological examination. Scar massage was recommended after suture removal at day 14. No physiotherapy was prescribed. The incidence of clinically significant pre or post operative complications was recorded and these were divided into local and systemic (cardio-cerebro-vascular). They were then divided into minor and major complications according to an adaptation of the Page and Stern Classification<sup>[17]</sup>. Major local complications included those requiring additional surgery and significantly compromised function like Complex Regional Pain Syndrome. The onset of haematoma was

**Table 1** A major haematoma was observed in 8 patients and a minor haematoma was recorded in 19 patients *n* (%)

	Group 1 (non stop aspirin)	Group 2 (stop aspirin)	Group 3 (never antiaggregated)	Total
Complications				
Major	1 (heart)		1 (acute haematoma)	2
Minor		1 (wound)		1
Total complications	1	1	1	3 (2)
Haematoma				
Major (> 20)	3	2	3	8
Minor (< 20)	7	7	5	19
Total haematoma	10	9	8	27 (18)

assessed locally at day 2 post-surgery (before resuming antiplatelet treatment in group 2) and at day 14 (after resuming antiplatelet treatment in group 2). In the absence of an objective method of assessing the haematoma, we decided to quantify its extent by calculating an arbitrary score of visible extension based on its area (maximal length along the proximal-distal axis x maximal length along the medio-lateral axis, measured in centimetres). A score of more than 20 in one of the two measurements was considered a “major” haematoma.

## RESULTS

There were no significant differences in the incidence of complications in the three groups. A total of 3 complications (2 major and 1 minor) and 27 visible haematomas was recorded. The two major complications were observed respectively in group 1 (non stop aspirin) and in group 3 (never antiaggregated). In group 1, one patient with pre-existing known coronary disease experienced perioperative atypical chest pains with non diagnostic electrocardiogram and serum enzymes. She was admitted to the intensive care unit during 24 h and discharged without specific treatment after a negative cardiac scintigraphy. In group 3, one patient suffered an acute compressive intracanalicular haematoma two hours after surgery due to uncontrolled arterial bleeding followed by immediate return to theatre. The minor complication, observed in one patient of group 2, consisted of a wound dehiscence, which only led to delayed wound healing. All haematomas were observed in the first 48 h, and none lasted for more than 2 wk. All resolved spontaneously. A major haematoma (score > 20) was observed in 8 patients: 3 in group 1, 2 in group 2 and 3 in group 3. A minor haematoma (score < 20) was recorded in 19 patients: 7 in group 1, 7 in group 2 and 5 in group 3 (Table 1). All patients at 90 d post-surgery (last follow up) were satisfied with the result in relation to the degree of the initial compression. Major and minor haematomas did not impair hand function or require physiotherapy.

## DISCUSSION

Our study shows that there were no significant differ-

ences between the 3 groups. There were no major complications in patients in whom aspirin was suspended, as described in other studies<sup>[2,7]</sup>. The occurrence of a complication did not affect the final outcome as assessed subjectively or objectively.

In our experience, the presence of post-operative local haematoma is a source of anxiety in patients. Sometimes, their anxiety justifies an urgent consultation to reassure them and their family doctor. We arbitrarily measured the external appearance of the local haematoma, but we could not say whether it was superficial or deep. However, this is irrelevant because each haematoma was asymptomatic and resolved spontaneously. Many studies have emphasized that aspirin withdrawal in patients with heart disease may lead to serious complications, including death<sup>[1,2,7,18,19]</sup>. Other studies recommend continuing antiplatelet therapy provided an adequate haemostasis is carried out<sup>[20]</sup>. On the other hand, because of IVRA, it is impossible to ensure a perfectly visible haemostasis, as in local anaesthesia and, therefore, postoperative compression bandaging is applied. There are no studies showing that a postoperative immobilization with a plaster decreases the risk of local bleeding<sup>[21]</sup>. Aspirin should only be discontinued peroperatively if the risk of bleeding and its consequences are expected to be similar or more severe than the cardiovascular risks after aspirin withdrawal (myocardial infarction, stroke, peripheral vascular occlusion or death)<sup>[11]</sup>. This type of surgery, in close proximity to peripheral nerves, exposes to the risk of developing an acute post-operative intracanalicular haematoma. The current literature advises to avoid antiplatelet agents only in eye surgery, neurosurgery and in surgery of the prostate<sup>[6,14,16,22-25]</sup>, where bleeding-related fatalities after aspirin ingestion have been reported. In carpal tunnel surgery, the onset of acute intracanalicular haematoma is always possible, in spite of complete opening of the transverse carpal ligament. In our study, we observed only one case of acute intracanalicular haematoma needing urgent re-operation, in a never anti-aggregated patient. Other similar studies<sup>[20,26,27]</sup> on the use of anticoagulant therapy rather than antiaggregant, in open CTR, also conclude that its continuation does not increase bleeding complications<sup>[9,28-32]</sup>. We used an arbitrary score for haematoma measurement, in the absence of a specific scoring system. The aim was to match the visible extension of the haematoma with the neurological impairment. No haematoma in our study had ill effects on the clinical recovery, compared to patients without haematoma. It is important to reassure patients and to avoid needless ultrasound examinations.

Continuation of anti-aggregation therapy does not influence the final outcome. The decision to operate and whether to discontinue aspirin must be individualized considering the nature of the procedure and the patient's medical condition. It may be appropriate to continue aspirin in certain patients at increased risk for a vascular event, ensuring adequate haemostasis throughout the procedure<sup>[11,21,33]</sup>. The decision to operate and whether to discontinue aspirin must be weighed against the risks related to indication

for which antiaggregation is being used. Decisions must be adapted case by case. In the case of patients taking dual antiplatelet therapy (aspirin and clopidogrel), we follow the cardiologist's recommendations<sup>[34,35]</sup>. As a result of this study, we have changed our protocol for open carpal tunnel release and now continue aspirin treatment perioperatively.

## COMMENTS

### Background

There are not many studies on intra- and post-operative complications of hand surgery in patients who take aspirin perioperatively. Bleeding complications can occur continuing antiplatelet therapy and stopping aspirin can lead to serious thromboembolic events.

### Research frontiers

In the case of patients taking dual antiplatelet therapy (aspirin and clopidogrel), authors follow the cardiologist's recommendations. As a result of this study, authors have changed the protocol for open carpal tunnel release and now continue aspirin treatment perioperatively.

### Applications

To investigate the effects of aspirin in patients undergoing hand surgery, authors performed a prospective study to determine whether patients who continued to take aspirin during carpal tunnel surgery had an increased incidence of clinically significant complications.

### Peer review

This is a prospective study evaluating the implications of antiplatelet therapy in open carpal tunnel surgery. The authors concluded that continuation of antiplatelet therapy does not influence post operative subjective and clinically objective final outcome. This is a well written manuscript that may add to the existing literature.

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