



Major thoracic surgery in patients under antiplatelet therapy

Francesco Cassiano, Cecilia Menna, Claudio Andreotti, Mohsen Ibrahim

Division of Thoracic Surgery, Faculty of Medicine and Psychology, Sant'Andrea Hospital, 'Sapienza' University of Rome, Rome, Italy

Correspondence to: Mohsen Ibrahim. Division of Thoracic Surgery, Faculty of Medicine and Psychology, Sant'Andrea Hospital, University of Rome 'Sapienza', Via di Grottarossa 1035, 00189 Rome, Italy. Email: mohsen.ibrahim@uniroma1.it.

Comment on: Yu WS, Jung HS, Lee JG, *et al.* Safety of thoracoscopic surgery for lung cancer without interruption of anti-platelet agents. *J Thorac Dis* 2015;7:2024-32.

Submitted Nov 22, 2016. Accepted for publication Nov 29, 2016.

doi: 10.21037/tcr.2016.12.64

View this article at: <http://dx.doi.org/10.21037/tcr.2016.12.64>

Advances in anticoagulant and antiplatelet regimes are associated with a significant risk reduction in the occurrence of thrombotic events. However, this thrombotic protection may carry an increased risk of bleeding during and after surgery. Aspirin is the main antiplatelet medication used in patients with coronary artery disease, nevertheless there is a growing evidence demonstrating that the use of the most potent antiplatelet medication, clopidogrel, on its own or in combination with aspirin, is more effective in both chronic and acute settings (1). The most recent recommendation for patients who have undergone to drug-eluting coronary artery stent placement advises to receive the dual antiplatelet therapy for at least 12 months. Dual antiplatelet therapy has become the mainstay treatment strategy for the prevention of stent thrombosis. Premature discontinuation of antiplatelet therapy markedly increases the risk of stent thrombosis, a catastrophic event that frequently leads to myocardial infarction and/or death (2). Antiplatelet drug management in patients with pre-existing coronary artery diseases remains an important consideration when these patients require an emergency or major elective operative procedure. Surgeon often face the dilemma of temporarily stopping antiplatelet therapy and risking adverse cardiac outcomes, specifically coronary stent thrombosis, or continuing treatment, risking increased operative or post-operative bleeding and its associated consequences (3,4). Because the lifespan of platelet is 8–9 days, the current standard of care includes stopping antiplatelet therapy for 5–7 days before an elective operative procedure or administering platelet transfusions in patients requiring an emergency operation when indicated. The French Society of the Anesthesiology expressed concern for the current trend of preoperative anti-platelet withdrawal, as there have

been reports of myocardial infarction and stroke in patients in whom antiplatelet treatment had been interrupted (5). A review (6) suggested that aspirin should only be discontinued in patients with coagulation disorders or when even small hemorrhage may lead to major complication. No evidence was found demonstrating any clinical significance increasing bleeding occurrence caused by aspirin in cardiovascular, vascular and orthopedic surgery, or after epidural anaesthesia. Strosber and colleagues (7) in their last review examined the outcomes of patients holding or under clopidogrel during the preoperative period. Any significant increase in adverse patient outcomes was identified in those patients who received preoperative clopidogrel within this population. They assert that it appears to be reasonable and safe to continue antiplatelet therapy with clopidogrel in this population for elective settings and that preoperative clopidogrel use does not increase the risk of bleeding in emergency circumstances. Cerfolio reported in 2010 series of patients undergoing major thoracic procedures without antiplatelet drugs interruption (8). The authors conclude that patients who are receiving clopidogrel, having a coronary artery stent placed can safely undergo to general thoracic surgery. Bertolaccini and colleagues (9) showed in their study that thoracic surgical procedures could be safely performed in patients receiving antiplatelet therapy at the time of surgery, with no increased risk of bleeding or morbidity and no differences in the operative time and the length of hospital stay.

The major limitation of the published studies is that they are often retrospective studies, and that the number of patients underwent surgery without interruption of antiplatelet drugs is lower than patients who did not stop antiplatelet drugs. In literature, there are a number of

reports advising the reduced risk of myocardial infarction, thrombosis and stroke by continuing antiplatelet therapy preoperatively.

As previously stated, there are evidences available supporting the no-interruption therapeutic choice in open surgery. However, studies on minimally invasive surgery are limited.

Fujikawa and colleagues in their work (10) analyzed the effect of antiplatelet therapy on surgical blood loss and perioperative complications in n=1.075 patients undergoing abdominal laparoscopic surgery. They conclude that abdominal laparoscopic operations have been successfully performed without any increase of severe complications in patients with antiplatelet therapy compared with patient without non-antiplatelet drug. Major lung resection is one of the most common procedures performed in thoracic surgery, but it may involve considerable bleeding and the occasional need for a transfusion and/or reoperation for bleeding in specific cases (11). Several intraoperative methods have been used to manage blood loss, including topical haemostatic agents, bipolar sealers or electrocautery (12,13). For these reasons, the approach of choice has always been the thoracotomy. However, the thoracoscopic approach became more common in recent years also due to the presence of new hemostatic devices (14).

Since the first VATS experiences were published in early 1990s minor and major anatomic pulmonary resections performed by a video-assisted thoracoscopic approach have proved to be safe and feasible. Over the years, VATS lobectomy has become the standard for the treatment of early stage non-small-cell lung cancer, with similar long-term oncological results compared to open lobectomy ones, ensuring an adequate lymph node dissection better tolerance and faster delivery to adjuvant chemotherapy (15). In 2009 Kawachi *et al.* (16) concluded that pulmonary vessel injury, longer operation times and greater blood loss have been frequently observed for VATS lobectomy procedures. Moreover, a high proficiency is required to perform VATS lobectomy, and the procedure should be performed by a well-trained surgeon as indicated by the results of this study. Furthermore, evidences from literature have shown that minimally invasive thoracic surgery compared to thoracotomy significantly reduces morbidity and length of hospital stay, providing a better quality of life for patients undergoing lobectomy for lung cancer (17).

In this retrospective study the authors evaluate the safety of antiplatelet therapy continuation during thoracoscopic surgery for lung cancer. A total of 164 patients were

divided into two groups for comparison: 106 patients with preoperative antiplatelet drug withdrawal (group 1) and only 58 patients without antiplatelet drug withdrawal (group 2). The analyzed outcomes were operating time, estimated blood loss, need for transfusion, amount and duration of chest tube drainage, length of hospital stay, change in hemoglobin, postoperative morbidity, and post-operative mortality. The authors conclude that the use of antiplatelet drug during thoracoscopic surgery for lung cancer could be safely continued. However, in patients with dual antiplatelet treatment (aspirin + clopidogrel) is better to stop clopidogrel and continue aspirin due to the increased risk of postoperative bleeding. The present study shows that in patients with dual antiplatelet therapy and pleural adherence postoperative bleeding is more common. In 2010 Cerfolio showed similar results in patients underwent to a redo-thoracotomy with dual antiplatelet treatment who needed a reoperation for postoperative bleeding.

The study presents some limitations, since it is a retrospective study, with a small sample of patients. However, it confirms that performing a VATS lobectomy in patients without interruption of antiplatelet therapy is a safe practice.

Since it has been advised to not discontinue antiplatelet therapy in high-risk patients, it could be useful to prospectively investigate on this patients' category, also testing the latest hemostatic devices (12,14). Moreover, patients undergoing to a redo-thoracotomy or patients with a pre-operative high risk of pleural adhesions may be considered special classes of patients. Thus, the new proposed transcatheter technology could be prospectively analyzed in terms of post-operative bleeding occurrence.

In conclusion, the study confirms that antiplatelet therapy should not be stopped in standard patients undergoing to thoracoscopic pulmonary lobectomy.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Translational Cancer Research*. The article did not undergo external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/tcr.2016.12.64>). The authors have no conflicts

of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Patrono C, Bachmann F, Baigent C, et al. Expert consensus document on the use of antiplatelet agents. The task force on the use of antiplatelet agents in patients with atherosclerotic cardiovascular disease of the European society of cardiology. *Eur Heart J* 2004;25:166-81.
2. Kim DH, Daskalakis C, Silvestry SC, et al. Aspirin and clopidogrel use in the early postoperative period following on-pump and off-pump coronary artery bypass grafting. *J Thorac Cardiovasc Surg* 2009;138:1377-84.
3. Hall R, Mazer CD. Antiplatelet drugs: a review of their pharmacology and management in the perioperative period. *Anesth Analg* 2011;112:292-318.
4. Metzler H, Kozek-Langenecker S, Huber K. Antiplatelet therapy and coronary stents in perioperative medicine—the two sides of the coin. *Best Pract Res Clin Anaesthesiol* 2008;22:81-94.
5. Mitchell SM, Sethia KK. Hazards of aspirin withdrawal before transurethral prostatectomy. *BJU Int* 1999;84:530.
6. Fijnheer R, Urbanus RT, Nieuwenhuis HK. Withdrawing the use of acetylsalicylic acid prior to an operation usually not necessary. *Ned Tijdschr Geneesk* 2003;147:21-5.
7. Strosberg DS, Corbey T, Henry JC, et al. Preoperative antiplatelet use does not increase incidence of bleeding after major operations. *Surgery* 2016;160:968-76.
8. Cerfolio RJ, Minnich DJ, Bryant AS. General thoracic surgery is safe in patients taking clopidogrel (Plavix). *J Thorac Cardiovasc Surg* 2010;140:970-6.
9. Bertolaccini L, Terzi A, Rizzardi G, et al. Risk is not our business: safety of thoracic surgery in patients using antiplatelet therapy. *Interact Cardiovasc Thorac Surg* 2012;14:162-6.
10. Fujikawa T, Tanaka A, Abe T, et al. Does antiplatelet therapy affect outcomes of patients receiving abdominal laparoscopic surgery? Lessons from more than 1,000 laparoscopic operations in a single tertiary referral hospital. *J Am Coll Surg* 2013;217:1044-53.
11. Little VR, Swanson SJ. Postoperative bleeding: coagulopathy, bleeding, hemothorax. *Thorac Surg Clin* 2006;16:203-7, v.
12. D'Andrilli A, Andreotti C, Ibrahim M, et al. A prospective randomized study to assess the efficacy of a surgical sealant to treat air leaks in lung surgery. *Eur J Cardiothorac Surg* 2009;35:817-20; discussion 820-1.
13. Uchiyama A, Miyoshi K, Nakamura K. VIO soft-coagulation system for major pulmonary resections: results in 68 patients with primary lung cancer. *Gen Thorac Cardiovasc Surg* 2011;59:175-8.
14. Ibrahim M, Menna C, Maurizi G, et al. Impact of Transcollation technology in thoracic surgery: a retrospective study. *Eur J Cardiothorac Surg* 2016;49:623-6.
15. Whitson BA, Groth SS, Duval SJ, et al. Surgery for early-stage non-small cell lung cancer: a systematic review of the video-assisted thoracoscopic surgery versus thoracotomy approaches to lobectomy. *Ann Thorac Surg* 2008;86:2008-16; discussion 2016-8.
16. Kawachi R, Tsukada H, Nakazato Y, et al. Morbidity in video-assisted thoracoscopic lobectomy for clinical stage I non-small cell lung cancer: is VATS lobectomy really safe? *Thorac Cardiovasc Surg* 2009;57:156-9.
17. Li WW, Lee TW, Lam SS, et al. Quality of life following lung cancer resection: video-assisted thoracic surgery vs. thoracotomy. *Chest* 2002;122:584-9.

Cite this article as: Cassiano F, Menna C, Andreotti C, Ibrahim M. Major thoracic surgery in patients under antiplatelet therapy. *Transl Cancer Res* 2016;5(Suppl 7):S1473-S1475. doi: 10.21037/tcr.2016.12.64