Outcomes of post-operative hemorrhagic complications in anticoagulated patients undergoing pars plana vitrectomy

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Purpose:
Perioperative anticoagulation may have important ramifications for both surgeons and patients in the context of vitreoretinal surgery. Data regarding hemorrhagic complications of direct oral anticoagulants (DOAC) are limited and standardized guidelines for surgeons regarding optimal perioperative management of patients on these medicines are lacking.

Methods:
This was a multicenter, retrospective analysis of longitudinal, aggregated electronic health records from a national database of multiple retina specialists across the United States (Vestrum Health Retina Database). We evaluated all patients undergoing pars plana vitrectomy (PPV) between January 1, 2013 and December 31, 2019 for the development of postoperative hemorrhagic complications, specifically retinal hemorrhage, vitreous hemorrhage, suprachoroidal hemorrhage, and hyphema within 6 months following vitreoretinal surgery. Patient medication lists were searched for any use of direct oral anticoagulants (DOACs) or warfarin prior to the date of surgery. We compared hemorrhagic rates between all DOACs and warfarin versus no anticoagulant use as well as a direct comparison between DOACs and warfarin.

Results:
A total of 98,937 eyes with no prior history of ocular hemorrhage underwent PPV. Of these eyes, 3,031 (3.06%) were on anticoagulant medication prior to surgery. Following surgery, 3,594 eyes (3.63%) developed a post-operative hemorrhage. When comparing the proportion of eyes that developed a post-operative hemorrhage, 149/2882 (4.92%) of the eyes with anticoagulation use prior to surgery developed a hemorrhage, while 3610/95,906 (3.76%) of the eyes with no prior anticoagulation use developed a post-operative hemorrhage ($p = 0.0010$). The mean time to hemorrhage was 44.2 days for prior anticoagulant use and 52.1 days for eyes with no history of anticoagulation prior to surgery ($p = 0.0695$). There was no difference in the development of post-operative hemorrhage when comparing warfarin and DOACs ($p = 0.7605$), however those on DOACs were more likely to develop hemorrhages (68/1421, 4.79%) compared to no anticoagulation use prior to surgery (3610/95,906, 3.76%, $p = 0.0432$).

Conclusions:
Use of DOACs prior to vitreoretinal surgery was associated with increased rates of post-operative hemorrhages. Rates and types of hemorrhages were similar for both DOACs and warfarin.