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Recommendations of the Polish Society of Ophthalmology regarding perioperative modifications of anticoagulant therapy in ophthalmic surgery

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Guidelines of scientific societies and associations (including the Polish Ophthalmological Society) do not constitute binding laws and do not determine the only correct procedures; they are only an opinion of a group of experts from a given field. The opinion reflects the current state of knowledge based on available scientific research results.

The guidelines do not exempt healthcare workers from personal liability with regard to making the correct decisions for individual patients.

Personal responsibility for the used therapeutic methods rests with all individuals who practise medicine. It should be based on thorough knowledge and practical skills, while observing necessary safety measures with regard to oneself and the patient.

Readers of this paper are obliged to make themselves familiar with current information on the presented treatments and pharmacotherapies with special attention paid to manufacturers' information on doses, time, and administration as well as side effects of the used drugs.

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INTRODUCTION

Over the last few years, there has been a notable increase in the proportion of patients on long-term anti-thrombotic therapy. Roughly 20% of the global population is estimated to take aspirin, while about 4% of the population other antithrombotic agents, including antiplatelet medications (P2Y₁₂ receptor inhibitors: clopidogrel, prasugrel, ticagrelor) and anticoagulants (warfarin, aceno-

coumarol, dabigatran, rivaroxaban, apixaban, edoxaban, betrixaban) [1].

The decision of whether to modify or maintain anticoagulant therapy in patients prior to ophthalmic surgery is based on multiple factors including the type of surgery and anesthesia, risk of thromboembolic events, and type of prevention (primary, secondary). In this paper, we present a consensus statement based on the available published data, including the guidelines of ophthalmology societies worldwide and the po-

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sition statement by experts of the Polish Society of Ophthalmology on the perioperative modifications of anticoagulant therapy in ophthalmic surgery.

The average risk of bleeding associated with ophthalmic surgery in the general population is estimated at 0.4%. It comprises the risk of intraretinal, suprachoroidal, and vitreous hemorrhage as well as recurrent anterior chamber hyphema and orbital hematoma. Aspirin, the most popular antiplatelet agent, is a non-steroidal anti-inflammatory drug that inhibits platelet aggregation. It is used both in primary prevention (prophylaxis) and secondary prevention (post episode) of thromboembolic events (including acute coronary syndrome and stroke). A dose of 75-150 mg effectively inhibits platelet aggregation for 7-10 days after commencing therapy. Importantly, dual antiplatelet therapy (DAPT = acetylsalicylic acid + P2Y12 inhibitor) significantly increases the risk of perioperative bleeding compared to aspirin monotherapy (15% vs. 4%) [2].

Anticoagulant and antiplatelet therapies available in Poland (as of December 2022) are listed in Tables I and II below. Patient management depends on the estimated risk of thromboembolic event. The high-risk group includes patients with atrial fibrillation and history of stroke, episode of venous thromboembolism within the last three months, artificial (mechanical) heart valve, cancer, and ejection fraction < 30%.

Recommended modifications to anticoagulant treatment are listed in Table III [2]. Nonetheless, it should be emphasized that any modification of long-term anticoagulant therapy increases the risk of thromboembolic events. Bridging therapy (usually with low-molecular-weight heparin) has also been shown to induce bleeding. The final decision regarding perioperative modification of treatment depends on the judgment of the cardiologist in charge of the patient [3].

The section below addresses in more detail the modifications of anticoagulant and antiplatelet therapies that are indicated in various ophthalmic procedures.

CATARACT

As a standard practice, cataract surgery does not require modifications to long-term anticoagulant therapy. However,

Table I. Anticoagulant groups and agents

Group	Agents	Remarks
Vitamin K antagonists	Acenocoumarol Warfarin	Need to monitor the INR (INR = 2-3 is considered the therapeutic range)
Indirect thrombin inhibitors	Unfractionated heparin Low-molecular-weight heparins	
Direct factor Xa inhibitors (oral)	Rivaroxaban Apixaban	
Direct thrombin inhibitors	Dabigatran	

it is important to highlight that these recommendations may need to be adjusted depending on the type of anesthesia required for the surgery. It is estimated that approximately 90% of phacoemulsification cataract surgeries are performed under topical anesthesia, which does not require any changes in anticoagulant treatment. Peribulbar or retrobulbar anesthesia increases the risk of postoperative bleeding, particularly in patients treated with P2Y12 inhibitors. Subconjunctival hemorrhage is observed in 4.5% of patients taking clopidogrel and 3.7% taking warfarin vs. 1.7% in patients not taking any anticoagulants after anesthesia other than topical (peribulbar, retrobulbar, subconjunctival, sub-Tenon's).

Most incidents are mild and self-limiting (subconjunctival hemorrhage, pinpoint hemorrhage). In patients on warfarin, the decision to modify anticoagulant therapy should be based on the INR result. However, it needs to be noted that a switch from warfarin is associated with an elevated risk of thromboembolic events, particularly stroke (up to 1/100 patients), and an increased risk of orbital hemorrhage (from 0.2% to 1% for invasive anesthesia) [1].

IRIDOTOMY

Aspirin or clopidogrel should be discontinued two weeks before scheduled iridotomy if anticoagulant therapy is prescribed for primary prevention, or continued if it is used for secondary prevention [1].

CAPSULOTOMY

No modification in anticoagulant therapy is needed [1].

GLAUCOMA SURGERY

There is evidence for a heightened risk of perioperative bleeding in glaucoma surgery in patients on all types of anticoagulation therapy. Intraoperative hemorrhagic complications increase the risk of permanent impairment of visual acuity. Bleeding into the anterior chamber during trabeculectomy may lead to filtering bleb failure and early surgical failure. Some surgeons allow anti-glaucoma surgery to be performed without withdrawing anticoagulant therapy, e.g. with warfarin, in patients with stable therapeutic INR levels or receiving treatment with aspirin for secondary prevention. The consensus of the available literature is that monotherapy with aspirin and P2Y12 receptor inhibitors should be discontinued when used for primary prevention, and continued when prescribed for secondary prevention. P2Y12 receptor inhibitors should be discontinued before glaucoma surgery when they are part of dual therapy (e.g. aspirin + clopidogrel) [4].

Table II. Antiplatelet agents

Antiplatelet agent	Duration of activity	Withdrawal before surgery
Clopidogrel	3-10 days	5 days
Prasugrel	5-10 days	7 days
Ticagrelor	3-4 days	5 days

Table III. Proposed perioperative management

Low risk:			High risk:		
<ul style="list-style-type: none"> • cataract surgery under topical anesthesia/sub-Tenon's block • corneal surgery • uncomplicated vitreoretinal surgery* • oculoplasty: chalazion surgery/removal of cyst/eyelid lesion (before the orbital septum) • strabismus 			<ul style="list-style-type: none"> • glaucoma surgery • extensive vitreoretinal surgery** • intraocular surgery in cancer treatment • oculoplasty (blepharoplasty and surgeries behind the orbital septum) • temporal artery biopsy • anticipated peribulbar anesthesia 		
Antiplatelet agents	Warfarin/ acenocoumarol	DOACs***	Antiplatelet agents	Warfarin/ acenocoumarol	DOACs
Continuation	INR on the day of surgery (if normal, no switch)	Skip 2 doses 2 days before the procedure, resume treatment 1-2 days after the procedure	<ul style="list-style-type: none"> • Aspirin/clopidogrel: discontinue 7 days before surgery, high-risk continuation • Prasugrel: discontinue 7 days before surgery • Ticagrelor: discontinue 5 days before surgery 	<ul style="list-style-type: none"> • Check INR 2 days prior to surgery; if INR < 2 in a patient at low risk of thrombosis, discontinue and resume in the evening of the day of surgery • Bridging therapy in other cases (with low-molecular-weight heparin 1 mg/kg BW, s.c.) 	Skip 2 doses 2 days before the procedure, resume treatment 1-2 days after the procedure

*Uncomplicated vitreoretinal surgery = epiretinal membrane surgery, macular hole surgery, retinal detachment surgery without PVR, especially 25G or 27G vitrectomy

**Extensive vitreoretinal surgery = vitrectomy in cases of endoresection for cancer treatment, due to diabetic retinopathy with massive proliferations, with anticipated extensive retinotomy, and in selected cases of posttraumatic vitrectomy

DOAC – direct oral anticoagulants

The decision on bridging therapy rests with the patient's cardiologist.

RETINAL SURGERY

The literature is inconclusive on the risk of bleeding and the need to modify therapy in vitreoretinal surgery. There is evidence for an increased risk of suprachoroidal hemorrhage after vitrectomy for diabetic retinopathy in patients receiving long-term treatment with aspirin or warfarin (approximately 1%) [5].

We recommend continuing anticoagulant therapy in patients undergoing surgery for epiretinal membrane, macular hole, and retinal detachment without PVR, especially when 25 G or 27 G vitrectomy is performed [6]. In patients requiring endoresections for cancer treatment, vitrectomy due to diabetic retinopathy with massive proliferations, with anticipated extensive retinotomy, and in selected cases of post-traumatic vitrectomy, discontinuation of anticoagulants is advised, with bridging therapy prescribed in selected cases.

EYELID AND ORBITAL SURGERY

In theory, surgical procedures involving structures up to the orbital septum are associated with a low risk of bleeding and do not require any modification of anticoagulant therapy. All procedures that interfere with the continuity of structures located behind the orbital septum, including ptosis surgery, and lower blepharoplasty, carry a high risk of bleeding and permanent damage to vision. Similarly, lacrimal duct surgery, including dacryocystectomy, is classified as a high-risk

procedure in terms of intra- and postoperative bleeding, and requires modification of anticoagulant therapy, as set out in Table III [7, 8].

CORNEAL SURGERY

The need to modify anticoagulant therapy in corneal surgery is determined primarily by the type of anesthesia used in the procedure. Corneal transplantation performed under topical anesthesia requires switching anticoagulant therapy because of the need to perform peribulbar block. Regardless of whether or not anticoagulant therapy is modified, the risk of suprachoroidal and vitreous hemorrhages during penetrating corneal grafting (the so-called “open sky” procedure) is among the highest in ophthalmology (approximately 0.4% and 0.7%, respectively) [9]. Pterygium surgery does not require changes of ongoing anticoagulation therapy.

The final decision is made on a case-by-case basis by the cardiologist and ophthalmologist in charge.

Ostateczna decyzja jest podejmowana indywidualnie we współpracy kardiologa i okulisty.

STRABISMUS SURGERY

Given the average age at strabismus surgery, which is mainly done in children, there are no recommendations for changing anticoagulant therapy in this surgical indication.

DISCLOSURE

The authors declare no conflict of interest.

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