



Obstetrics and Gynaecology Cases - Reviews

CASE REPORT

Cangrelor in an Obstetric Patient Undergoing Cesarean Section on Dual Antiplatelet Therapy after Cerebral Stent Placement: A Case Report

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Abstract

In this case, a 34-year-old woman G1P0 at 31 weeks gestation required intracranial stenting for an acute ischemic stroke. She was placed on aspirin and clopidogrel to prevent stent occlusion. The patient wished to undergo a cesarean delivery. Patients on dual antiplatelet therapy are at high risk of hemorrhage. Five days prior to the surgery, clopidogrel was replaced with cangrelor, a short-acting, reversible P2Y₁₂ receptor inhibitor which was turned off at anesthesia induction. Surgery and the postoperative course were uncomplicated. Cangrelor was used as bridge therapy while the patient was taken off the clopidogrel and blood loss was minimized.

Keyword

Ischemic stroke, Cangrelor, Clopidogrel, Pregnancy

Introduction

Ischemic stroke during pregnancy is a rare event, occurring in 12.2 per 100,000 pregnancies [1]. In the case presented here, mechanical thrombectomy was performed followed by the placement of two stents. The stents used were designed for coronary use. In the early days of coronary stents, risk of re-thrombosis was 25% within 14 days without dual antiplatelet therapy [2]. To prevent clotting of these stents, the patient was placed

on clopidogrel and aspirin with the goal being to keep the patient on these drugs for 6 months. For a pregnant patient, this dual antiplatelet regimen could result in significant bleeding upon delivery. A few reports exist of pregnant women with coronary stents on clopidogrel. In these reports, clopidogrel was stopped a day before a planned delivery [3,4]. Despite stopping the drug, these patients lost half of their blood volume on delivery. In this case, a new, reversible P2Y₁₂ receptor inhibitor was used to bridge the patient off clopidogrel so that she would not experience massive blood loss. HIPPA authorization was obtained for this case report.

Case Description

The patient was a 34-year-old G₁P₀ woman at 31 weeks gestation who presented with acute onset left hemiparesis and sensory loss. Cerebral angiography confirmed an M2 branch of the right internal carotid artery occlusion. Angioplasty and stenting with 2 balloon mounted coronary stents achieved patency of the artery. Following stenting, the patient was loaded with clopidogrel and aspirin, with a recommendation to continue clopidogrel 75 mg and aspirin 81 mg daily for 6 months. The patient had minimal left sided weakness after the procedure with complete resolution of the



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stroke symptoms the following day. The mechanism of the stroke was thought to be due to intrinsic intracranial stenosis in the setting of physiologic hypercoagulability of pregnancy.

While on dual antiplatelet therapy, the patient was not a candidate for epidural labor analgesia. The stroke team stated that the patient was highly likely to develop stent thrombosis and stroke if the antiplatelet agents were held, even for a brief period. The patient did not feel that she could endure labor and a vaginal delivery without epidural analgesia, so she opted for an elective cesarean section under general anesthesia. A multidisciplinary team consisting of maternal fetal medicine, neurology, anesthesiology and pharmacy planned the delivery to take place at 37 weeks gestation. Given the high risk of hemorrhage during surgery on dual antiplatelet therapy, cangrelor was chosen to replace clopidogrel perioperatively.

Five days prior to the scheduled cesarean section, clopidogrel was discontinued and a continuous infusion of cangrelor was initiated at a rate of 0.75 mcg/kg/min. On the day of delivery, the patient was prepped and draped and underwent induction of general anesthesia. The airway was easy to secure. The cangrelor infusion was paused at the time of skin incision. To monitor the patency of the cerebral stents and the integrity of cerebral perfusion, electroencephalography was observed continuously during the period when the cangrelor infusion was turned off. The cesarean section proceeded with a Pfannenstiel skin incision and low transverse hysterotomy. The baby was delivered with 9, 9 Apgar scores. After hemostasis of the uterine incision was achieved (25 minutes from incision to closure), the cangrelor infusion was restarted. Estimated blood loss was 400 mL. On postoperative day 1, the cangrelor was discontinued and 600 mg clopidogrel given. On postoperative day 2, a maintenance dose of 75 mg of clopidogrel was resumed. The patient recovered well and was discharged on postoperative day 3 on clopidogrel and aspirin. Her hemoglobin upon discharge was 10.5 gm/dL, a drop from 11.1 gm/dL pre-operatively.

Conclusion

Stroke during pregnancy is a rare but serious event. As was mentioned in the introduction, bare metal stents are highly prone to thrombosis until they have been endothelialized. The rates of stent thrombosis relate to the size of the vessel and the amount of bare metal. In this case, two stents were used and the location was a distal portion of the internal carotid artery. Both characteristics make the risk of thrombosis high without dual antiplatelet drugs.

Following stent placement, dual antiplatelet therapy with aspirin and a P2Y₁₂ receptor inhibitor is recommended for 6 months [5]. The most common irreversible P2Y₁₂ receptor inhibitor is clopidogrel. Clopidogrel

irreversibly inhibits the P2Y₁₂ subunit of the platelet ADP receptor [6]. Dual antiplatelet therapy decreases the risk of stent thrombosis and recurrent ischemic events but also increases the risk of hemorrhage [6]. When procedures are unavoidable, as in obstetrics, cangrelor, a reversible P2Y₁₂ receptor inhibitor approved for coronary stents, is a way to balance the possibility of high blood loss with risk of stent thrombosis [7]. Of note, use with intracranial stents is off label.

Cangrelor is an intravenously administered, rapidly reversible P2Y₁₂ receptor inhibitor [8]. Cangrelor has a 6-minute half-life and allows for rapid restoration of platelet function. Several surgical specialties have described its use in patients with cardiac stents as bridge therapy prior to coronary artery bypass graft surgery [6]. For cesarean delivery, carrying the risk of high blood loss, cangrelor is attractive due to its rapid offset of effect.

In a prospective randomized placebo-controlled study, cangrelor was shown to have a greater degree of platelet inhibition prior to and during cardiac surgery, with equal rates of major bleeding complications compared to patients receiving placebo [6]. In the aforementioned trial, the infusion dose of 0.75 µg/kg/min was used, which was the same dose chosen for this obstetrical patient. The half-life of cangrelor is 6 minutes, so it is essential that the infusion not be interrupted until medically necessary. Following completion of the required procedure, the patient is transitioned back to the oral, irreversible P2Y₁₂ inhibitor. To avoid potential drug-drug interactions, the cangrelor infusion should be discontinued before clopidogrel is given because cangrelor binds competitively with the P2Y₁₂ receptor and prevents the binding of clopidogrel [7].

The route of delivery was discussed with the patient in a multi-disciplinary fashion. Given the inability to provide neuraxial analgesia for what was likely to be a lengthy induction process; given that this was her first pregnancy and that labor induction would carry a risk of 20-30% risk of conversion to cesarean section; and, bleeding risks are greater in the setting of a prolonged labor induction, the patient opted for a primary cesarean delivery [9]. The anesthesia plan was for general anesthesia given the inability to safely administer neuraxial anesthesia in the setting of dual antiplatelet therapy.

When surgery is unavoidable and stopping dual antiplatelet therapy presents a high risk of stent thrombosis, cangrelor should be considered as an alternative to clopidogrel or other irreversible P2Y₁₂ receptor inhibitors. Given the long duration of anti-platelet effects of drugs like clopidogrel, conversion to cangrelor requires extensive preoperative planning. Our case is the first description of the use of cangrelor in a patient with an intracranial stent, as well as during cesarean delivery.

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Authors Contribution

Lauren Carlos: This author wrote the original manuscript.

Stephanie Paolini: This author contributed to the manuscript.

Christine Hawkes: This author wrote the description of the procedure.

Janet FR Waters: This author did extensive edits to the manuscript.

Ashutosh Jadhav: This author directed stroke care and contributed to the manuscript.

Jonathan H. Waters: This author did extensive edits and did the submission.

Financial Disclosures

None.

Conflicts of Interest

None.

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