Very late drug eluting stent thrombosis following antiplatelet discontinuation: a retrospective study

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BACKGROUND

The recommended therapy for the prevention of stent thrombosis after coronary stent implementation is dual antiplatelet therapy, namely clopidrogrel (Plavix, sanofi-aventis, Bridgewater, NJ) and aspirin per the American College of Cardiology/American Heart Association (ACC/AHA). [1] Premature discontinuation of anti-platelet therapy is often requested by the surgical team to prevent peri-operative hemorrhaging. In patients with coronary stents, these instructions can increase the risks of stent thrombosis[2], induce a rebound increase of platelet activation and aggregation[3] and lead to adverse postoperative cardiac complications such as ST-segment elevation, myocardial infarction (MI) or death.

Unlike Bare Metal Stents (BMS), Drug Eluting Stents (DES) have been associated with delayed endothelialization[4] and localized hypersensitivity reactions[5]. Despite a small percentage (1%) [6-8] of sub acute stent thrombosis, recent concerns of "very late" DES thrombosis have been reported to occur months or even years after DES deployment[9-10]. In a large observational study, stent thrombosis occurred in 29% of patients treated with DES who discontinued anti-platelet therapy[11]. Apart from delaying surgery when possible, the ACC/AHA has established a guideline of least a 12 month dual antiplatelet therapy of 75mg of clopidogrel and aspirin 325mg after DES deployment to avoid stent thrombosis.[1] Late stent thrombosis occurs anywhere from 1 month to years after DES deployment.

METHODS

An IRB approved retrospective chart review from 2005 to 2011was conducted for patients with a history of drug eluting stent (DES) deployment, who terminated anticoagulant therapy prior to surgery and developed postoperative stent thrombosis.

RESULTS

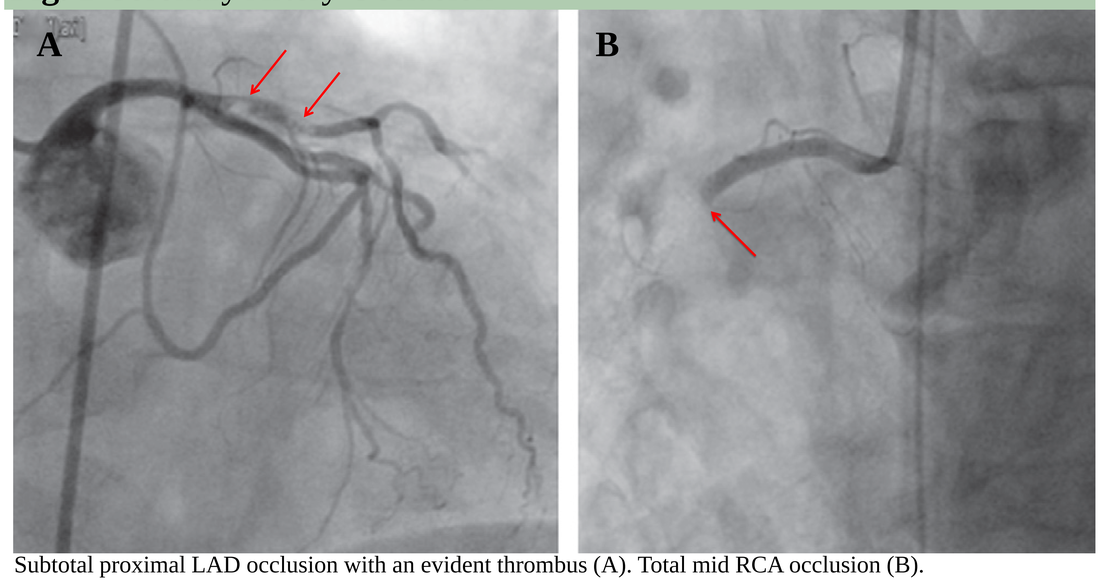
The review revealed 5 cases of postoperative cardiac complications that occurred in the immediate postoperative period (Table 1). Patients were 4 males and 1 female with a mean age of 55.8 years. All patients had DES deployed 10-42 months prior to surgery with a mean of 24.4 months. Antiplatelet therapy was discontinued 4-7 days prior to surgery with a mean of 5.4 days. All patients were operated upon by different surgeons. All surgeries were elective and best classified as intermediate cardiac risk surgeries according to the ACC/AHA guidelines. All patients had stable coronary artery disease. Coronary angiography was performed in 4/5 patient and revealed acute coronary thrombosis. One patient experienced postoperative left arm pain followed by hemodynamic instability and cardiac arrest with failed resuscitative efforts.

Table 1: Patient characteristics, onset of stenting and stopping antiplatelet therapy and observed post-operative complication.

N	Age	Sex	Surgery	Stent type	Onset of stenting	Onset of stopping clopidogrel	Postoperative event
1	54	male	Bilateral knee replacement	DES	42 m	Plavix stopped 4 d prior. Coumadin stopped and bridged with lovenox	Post-op cardiogenic shock due to LAD and LCX stent thrombosis
2	55	female	Hernia repair	DES	10 m	Aspirin and effient stopped 5 d prior to surgery	STEMI due to total LAD occlusion
3	55	male	Spondylosis	DES	36 m	Aspirin and plavix stopped 1 w prior to surgery	In-stent thrombosis of the LCX and 2nd diagonal branch.
4	56	male	Gastric banding	DES	19 m	Plavix stopped 1 w prior to surgery	V-fib cardiac arrest due to totally occluded ramus intermedius.
5	59	male	Revision Subtalar ankle fusion	DES	15 m	Aspirin and plavix stopped 4 d prior to surgery	Left arm pain followed by cardiac arrest and death

DES; drug eluting stents, M; months, D; days, W; week, LAD; left anterior descending, LCX; left circumflex, STEMI; ST segment elevation

Fig. 1 Coronary Artery Occlusion



Subtotal proximal LAD occlusion with an evident thrombus (A). Total mid RCA occlusion (B).

CONCLUSION

In contrast to BMS, DES have a higher potential for very late stent thrombosis (>1 year). This can be provoked by the withdrawal of antiplatelet therapy in the perioperative period. Rebound increase of platelet activation and aggregation has also been noted with discontinuation of antiplatelet therapy [3]. Physicians should be very cautious when deciding to discontinue antiplatelet therapy for these patient subgroups. We propose to resume one antiplatelet drug in the perioperative period in patients with DES unless the bleeding risk is extremely high.

REFERENCES

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