



Pregnancy and Spontaneous Coronary Artery Dissection: Lessons From Survivors and Nonsurvivors

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Spontaneous coronary artery dissection (SCAD) is an important cause of myocardial infarction associated with pregnancy (P-SCAD).^{1–3} It is also an understudied cause of maternal death.⁴ The present study aimed to report clinical presentation and management of P-SCAD in survivors and non-survivors and to investigate the outcome of pregnancies in women with previous SCAD.

Patients were recruited from European SCAD registries with SCAD events from 1984 to 2021. All registries were approved by national or institutional ethical review boards. All patients gave written informed consent. The P-SCAD case series consisted of 82 patients (median age, 36 years [interquartile range, 5]; 94% never/former smokers, 85% White, 15% with hypertension, 5% with diabetes, 13% with dyslipidemia, 2% with previous stroke, 22% with family history of coronary artery disease, 16% with extracoronary arteriopathies, and 48% with incomplete screening). Patients were alive at the time of enrollment and presented with SCAD confirmed on invasive angiography occurring during pregnancy or within 12 months of delivery, miscarriage, or termination. The pregnancy after previous SCAD series consisted of 37 pregnancies in 28 patients with angiographically confirmed SCAD who reported a subsequent pregnancy, whether ending in live birth, miscarriage, or termination.

Data on 13 patients who did not survive P-SCAD were collected from the MBRRACE-UK audit of maternal deaths.⁵

The timing of SCAD in the P-SCAD case series is shown in the Figure. Few ($n = 5$) SCAD events occurred during pregnancy, with the peak time of vulnerability the first month after delivery. One patient had P-SCAD 4 months after miscarriage during her first trimester. Another had P-SCAD 3 weeks after medical termination.

Patients with P-SCAD had high-risk features at presentation (Figure), with 49% (40/82) presenting with ST-segment-elevation myocardial infarction. On angiography, 38% (31/82) involved proximal coronary segments, with 19% (15/81) multivessel and 57% (46/81) multisegment disease.

The proportion of patients managed conservatively with respect to revascularization was 56% (46/82; Figure). A total of 12% (10/82) were referred for coronary artery bypass surgery, and 32% (100/315) had percutaneous coronary intervention. When stents were needed, the median number of stents used was 3 (range, 1–8). The most common stented artery was the left anterior descending coronary artery. Of patients undergoing percutaneous coronary intervention, 40% (11/27) had complications during intervention (6 iatrogenic dissection,

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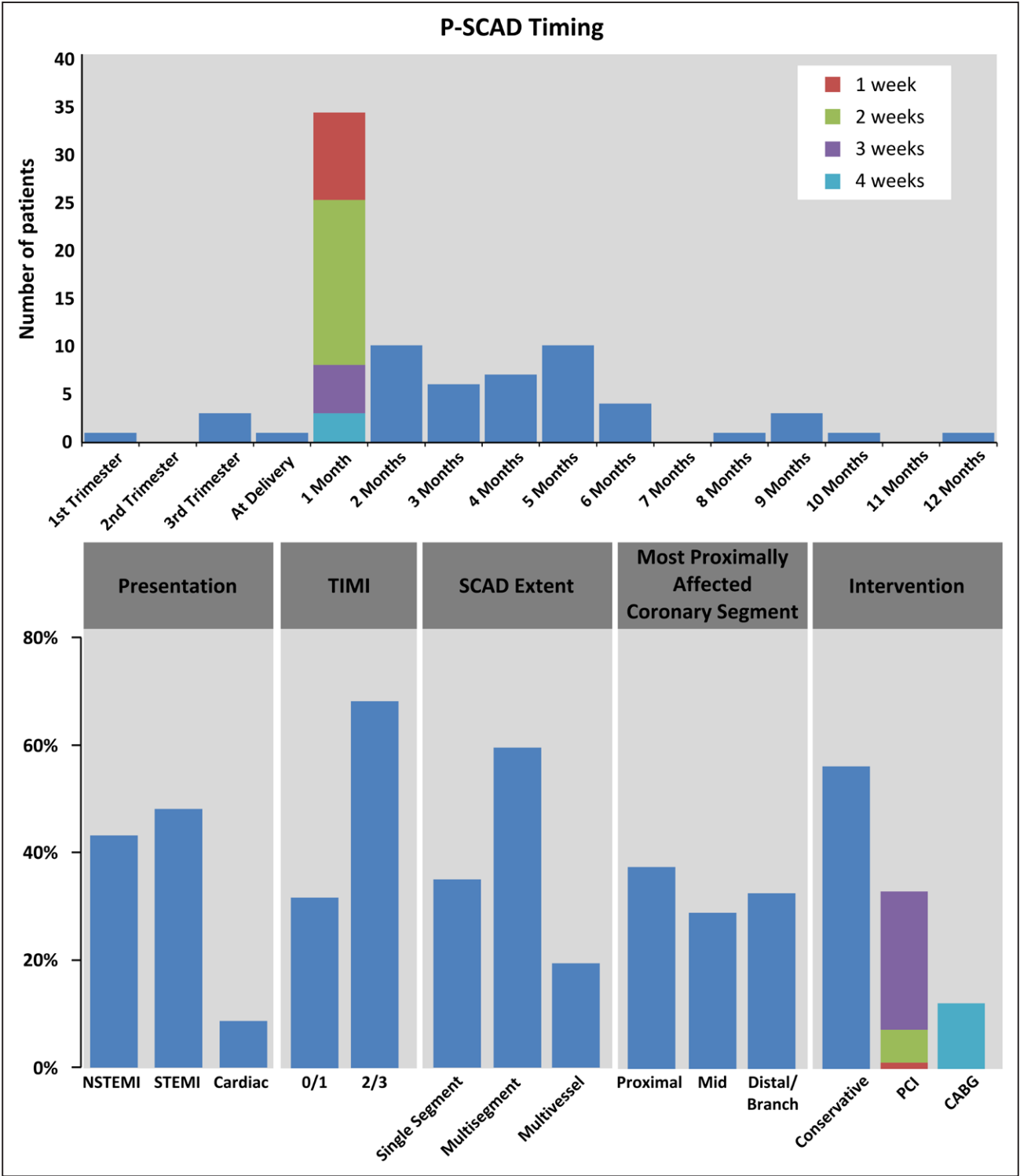


Figure. Timing, presentation, and revascularization management of patients with spontaneous coronary artery dissection associated with pregnancy.

One patient with spontaneous coronary artery dissection associated with pregnancy (P-SCAD) did not receive angiography of the right coronary artery. CABG indicates coronary artery bypass grafting; NSTEMI, non-ST-segment-elevation myocardial infarction; PCI, percutaneous coronary intervention; SCAD, spontaneous coronary artery dissection; STEMI, ST-segment-elevation myocardial infarction; and TIMI, Thrombolysis in Myocardial Infarction.

3 hematoma extension, 1 distal occlusion, and 1 failed percutaneous coronary intervention leading to coronary artery bypass surgery).

Of the 5 women whose SCAD occurred before delivery, 2 gave birth vaginally and 3 by cesarean section (2 were planned cesarean sections because of the recent

Nonstandard Abbreviations and Acronyms

P-SCAD	spontaneous coronary artery dissection associated with pregnancy
SCAD	spontaneous coronary artery dissection

SCAD and 1 was an emergency cesarean section because of unsuccessful labor induction) with a median gestation at birth of 39 weeks (range, 31–40 weeks).

In the cohort of patients with pregnancy after SCAD, the estimated time of conception was a median of 30 months (interquartile range, 25.5) after the most recent SCAD event. Of the 28 patients who became pregnant after SCAD, in 12 cases the index SCAD event was P-SCAD. Of 37 pregnancies, 3 women opted for medical termination (in each case, because of medical advice received about the risk of pregnancy) and 7 spontaneous miscarriages occurred in 3 patients. Of women proceeding to birth, median gestation at delivery was 39 weeks (range, 36–42 weeks). A total of 41% gave birth by cesarean section. The median birthweight was at the 30th percentile, with 16% of infants small for gestational age. A total of 17 of 35 patients (49%; 2 missing data) were taking β -blockers during pregnancy. Three pregnancy-associated major adverse cardiovascular and cerebrovascular events occurred among the 37 patients (8%). One occurred during pregnancy (recurrent acute myocardial infarction at 19 weeks of gestation, likely recurrent SCAD but managed without invasive angiography) and 2 angiographically confirmed recurrent SCAD events occurred within 12 months of delivery. There were no maternal or neonatal deaths as a consequence of these events.

Of 13 maternal deaths in MBRRACE-UK attributable to SCAD, 3 occurred during pregnancy and 10 occurred postpartum (median, 16 days postpartum [range, 10–94]). Twelve women had an out-of-hospital cardiac arrest. Three women underwent angiography, including the woman presenting alive to the hospital and 2 women who had angiography during active resuscitation. None underwent revascularization. Three women are recorded as having reported symptoms before cardiac arrest. At postmortem examination, sites of coronary dissection were mostly proximal (7 of 10; 3 not reported), with the left anterior descending the most common coronary location (9 of 11; 2 not reported). One-quarter (3 of 11; 2 not reported) had multivessel dissections. Histopathologic evidence of myocardial necrosis or infarction was seen in 8 of 11 (2 not reported), with evidence of extra-coronary arteriopathy reported in one.

The data, analytic methods, and study materials will be made available to other researchers on reasonable request to the corresponding author for purposes of reproducing the results. The data presented

are observational. We acknowledge the potential for selection bias.

P-SCAD predominantly occurs in the first 6 months postpartum, with few cases occurring during pregnancy. Although P-SCAD has an aggressive phenotype, many women are managed conservatively with favorable outcomes. Most deaths in P-SCAD result from sudden fatal arrhythmia with little apparent opportunity for medical intervention. Pregnancy after SCAD carries a modest recurrence risk, which should be discussed as part of individualized preconception counseling.

ARTICLE INFORMATION

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