

Letters to the Editor

Kissing Balloon-Expandable Iliac Stents Complicated by Stent Fracture

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Editor:

Balloon angioplasty and stent placement is a well-documented approach used in the treatment of common iliac artery stenoses in patients with peripheral vascular disease. For stenoses that involve the common iliac artery origin, the “kissing” stent technique is a common method of endovascular treatment. Balloon-expandable and self-expanding stents have been used, with balloon-expandable stents commonly being used in straighter segments and shorter lesions and self-expandable stents being more often used in tortuous and longer segments. There is a growing awareness of stent fracture, particularly in the newer nitinol self-expanding stents. This is of most concern when these stents are used in the superficial femoral arteries, when used across joints, and when long segments are treated or multiple overlapping stents are used (1–4). Balloon-expandable stents, particularly when placed in straight segments of arteries, are believed to be essentially immune to stent fracture. We know balloon-expandable stents can be crushed or deformed when placed in a superficial location or at sites where external forces can lead to compression (eg, neck, below the inguinal ligament, across joints, thoracic outlet, airway), but stent fractures involving balloon-expandable stents in the iliac arteries are extremely rare or underreported. There are a few reports of stent fractures involving the sirolimus-eluting balloon-expandable coronary stents (Cypher Stent; Cordis/Johnson & Johnson, Warren, New Jersey) (5–7) and fractures involving balloon-expandable bare stents used for placement in the pediatric cardiac conduit (8).

Herein, we describe an interesting case of “kissing” balloon-expandable iliac artery stent placement complicated by stent fracture and accompanying vessel occlusion. The institutional review board at our institution does not require approval for retrospective case reports.

A 37-year-old man with a 17-year, 3½-pack-per-day cigarette habit presented to our medical center with a 2-year history of gradually worsening left calf, thigh, and buttock claudication. The patient’s history was significant for a vigorous exercise regimen, including extensive stretching and calisthenics as he was trained by the armed forces in physical education. The ankle-brachial index was 1.10 on the right and 0.51 on the left. The results of physical examination were significant for a weak left femoral pulse and weak distal left-sided pulses. The patient underwent diagnostic angiography and successful 10-mm angioplasty of a critical left common iliac stenosis. Five years later, the patient pre-

sented with similar symptoms on the right, with no further symptoms on the left. He continued to smoke but reduced the amount from 3½ packs per day to 1 pack per day. He had a decreased right femoral pulse and barely palpable distal pulses on the right. Angiography demonstrated a critical stenosis of the proximal right common iliac artery (**Figure, a**). The patient was treated with kissing iliac stent placement as it was believed that a unilateral stent placement may have compromised the left iliac flow. Bilateral balloon-expandable stents (PG395B Genesis Stents; Cordis/Johnson & Johnson) were deployed in the proximal common iliac arteries at the aortic bifurcation and simultaneously dilated to 8 mm. There was a good cosmetic result, with good flow bilaterally demonstrated at angiography (**Figure, b**). The patient had strong femoral pulses bilaterally. No further documented ankle-brachial indexes were found in the patient’s chart. He did well for another 2½ years, during which time he continued his exercise regimen and then presented again with bilateral claudication. He had decreased his tobacco use to ½ pack per day. A physical examination at this time revealed a weak but palpable pulse at the right common femoral artery and a nonpalpable pulse at the left common femoral artery. Angiography revealed in-stent stenosis within the right common iliac stent and an occluded left common iliac artery stent with extensive collateral formation (**Figure, c**). Magnified spot radiographs demonstrated bilateral stent irregularities with complete fracture of the left-sided stent and some apparent widening of the stent interstices on the right (**Figure, d**). The findings were discussed with the patient and the vascular surgeon, and the patient went on to have a successful aortobifemoral bypass surgical procedure.

The case was interesting mainly because of the fracture of the left-sided balloon-expandable stent (and possible stent fatigue of the right-sided stent) in light of the reports and concerns regarding fractures of the newer nitinol self-expanding stents. In fact, a review of the literature found no mention of stent fractures involving the use of balloon-expandable stents in the periphery. There have been reports of stent fractures involving drug-eluting coronary stents and balloon-expandable bare stents used for the treatment of obstructed right ventricle-to-pulmonary artery conduits (5–8).

It has been suggested that exercise plays an important role in the development of stenoses and obstruction of the external iliac arteries in patients who bicycle vigorously (9,10). Our patient exercised on a daily basis. His exercises included intensive stretching and flexing of his torso and legs, and we believed that was the most likely cause of the deformation and ultimate fracture. The stents used in this patient have the same general stent characteristics as the drug-eluting Cypher coronary stent.

We were unable to identify any reports of fractures involving balloon-expandable stents in the periphery, yet if enough stress is placed upon these stents, they possibly could fracture as was seen in our case. Although we most often associate stent fractures with the newer nitinol self-expanding stents, it may be wise to advise patients treated with balloon-expandable iliac stents who partake in flexion/extension-type exercise to modify their exercise routine. This may be more relevant today as more and more people are performing yoga, pilates, and other activities that require considerable flexibility. Alternatively, one can monitor these patients closely with more frequent

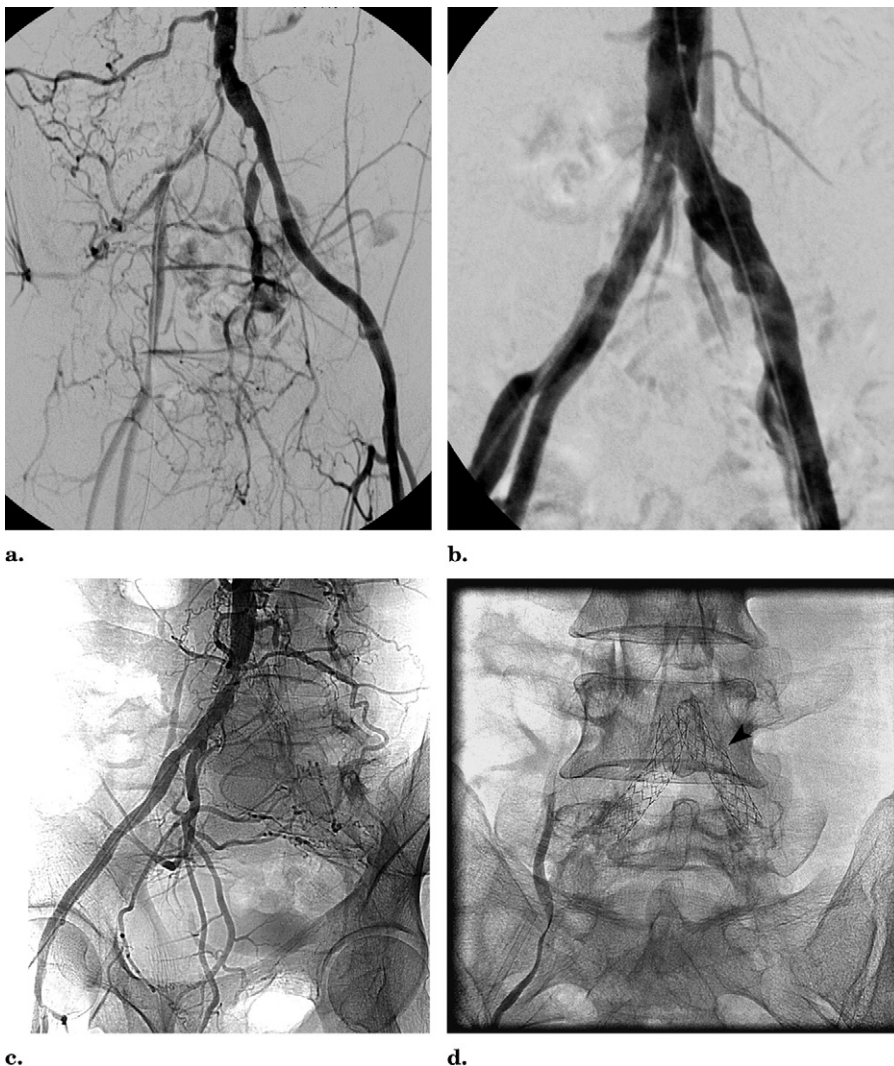


Figure. (a) Angiogram shows critical disease of the right common iliac artery. (b) Angiogram obtained after initial bilateral common iliac artery stent placement with balloon-expandable stents. (c) Angiogram obtained 2½ years later shows occlusion of the left common iliac artery stent (late filling of the distal common iliac, internal iliac, and external iliac arteries was seen) and in-stent stenosis of the right common iliac artery stent. (d) Anteroposterior spot radiograph shows complete fracture of the left common iliac artery stent (arrow-head) with some possible widening of the interstices of the right common iliac artery stent.

physical examinations and noninvasive imaging. In these patients, angioplasty alone can be considered or the more flexible self-expanding stents can be used, but, again, frequent monitoring should be implemented.

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