International Journal of Scientific Reports
Hossain MF et al. Int J Sci Rep. 2024 Mar;10(3):92-94
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164

DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20240446

Case Report

Surgical management for a retained guidewire *in vivo* during percutaneous coronary interventions following acute myocardial infarction from descending thoracic aorta to external iliac artery: a case report

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Received: 23 December 2023
Revised: 12 January 2024
Accepted: 18 January 2024

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ABSTRACT

This case report describes the unique presentation of a 60-year-old woman who was referred from the cardiology department due to the retention of a guidewire following a coronary angiogram. The guidewire was inadvertently left in the right external iliac artery after the angiogram procedure. This report discusses the clinical presentation, diagnostic procedures, and successful management of this case without unusual complication. The successful removal of the retained guidewire culminated in a favourable outcome for the patient. Efforts to extract residual guide-wire fragments from the coronary circulation are generally the preferred course of action. Nevertheless, certain case reports and series have proposed that, in carefully selected patients, leaving the guide-wires in situ without attempting extraction may be a reasonable option when the likelihood of successful removal appears remote, considering anatomical and technical factors. For such cases, a more suitable approach involves administering systemic anticoagulation and antiplatelet agents, coupled with vigilant follow-up.

Keywords: Guidewire entrapment, Guidewire in vivo, Retention of guidewire following coronary angiogram

INTRODUCTION

Coronary angiography stands as a cornerstone in the diagnostic armamentarium of cardiology, providing invaluable insights into the intricate vascular landscape of the coronary arteries. However, as with any medical procedure, complications can arise, ranging from the mundane to the exceptionally rare. This case report delves into a unique and infrequently documented complication - the retention of a guidewire following a coronary angiogram in a 60-year-old female patient.

In the realm of interventional cardiology, guidewires are indispensable tools, threading the path for catheters to navigate the vasculature during angiographic procedures. Despite the routine nature of these interventions, instances of guidewire retention are exceptionally rare, and their consequences can be clinically significant. This report sheds light on a case where a guidewire, initially employed for a coronary angiogram, was inadvertently left in the external iliac artery extending up to descending thoracic aorta, posing challenges in diagnosis and necessitating prompt intervention.[1-3]

The entrapment and fracture of a coronary guide wire represent infrequent complications in the context of percutaneous coronary interventions (PCI). The reported incidence of these complications is approximately 0.1-0.2%.[1,4] Entrapment or excessive rotation of the distal tip of the angioplasty guide wire can potentially lead to wire rupture.[5] When an excessive bending force is applied, particularly at the junction between the highly flexible distal 3-centimeter tip and the rest of the guide wire, it may result in wire fracture.[6] Recent reports have highlighted the occurrence of hardware components being retained in the coronary tree, further complicating coronary angioplasty procedures.[1,7]

CASE REPORT

A 60-year-old woman who was referred from the cardiology department, National Institute of Cardiovascular Disease and Hospital, Shere-Bangla Nagar, Dhaka due to the retention of a guidewire following a coronary angiogram. The guidewire was inadvertently left in the right external iliac artery after the angiogram procedure. This report discusses the clinical presentation, diagnostic procedures, and successful management of this case without unusual complication.

Diagnostic challenges and imaging modalities

Chest X-ray PA view including upper part of the abdomen and X-ray pelvis with lower part of abdomen was performed to locate exact situation of guidewire (Figure 1a and b), although contrast-enhanced computed tomography (CT) angiography emerged as a pivotal tool for confirming the diagnosis and providing detailed anatomical information.

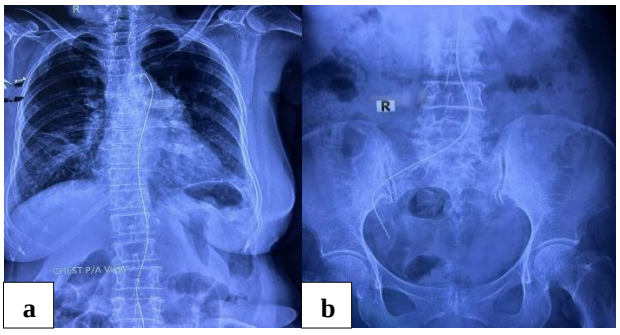

Figure 1: (a) Chest X-ray PA view including upper part of the abdomen showing retained guidewire extending from descending thoracic aorta to abdominal part of aorta, and (b) X-ray pelvis including lower part of abdomen showing retained guidewire extending up to iliac artery.

In this case, the guide wire was removed surgically. External iliac artery was exposed following lower right paramedian incision of abdomen, proximal and distal control taken. Then arteriotomy done. Guidewire gently removed without any complication (Figure 2). Iliac artery was repaired (Figure 4). Wound was closed by layer. Patient was shifted to ICU after ensuring all vital parameters were normal.

Figure 2: Surgical extraction of guide wire.

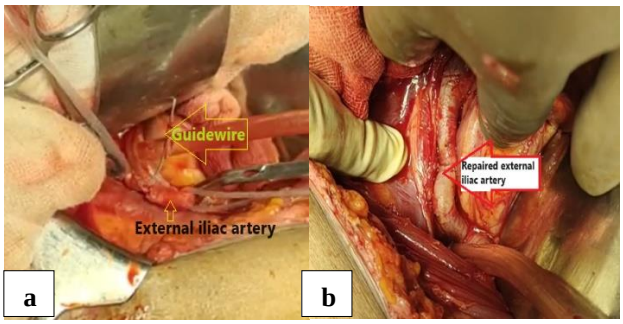

Figure 3: (a) Extraction of guidewire by external iliac arteriotomy, and (b) repaired iliac artery following guidewire extraction.

Figure 4: Guidewire after extraction surgically.

DISCUSSION

Guidewire retention is an infrequent complication of percutaneous coronary intervention more recently, Iturbe et al reported an incidence of 0.08% in 2,238 consecutive patients.[8] In the patient featured in this report, entrapment of guidewire inside aorta upto iliac artery, a situation that was previously reported.[9] Although percutaneous removal is the preferred option, extensive manipulation can lead to catastrophic complications, including coronary dissection, thrombosis, myocardial ischemia from coronary obstruction, or embolization of the guidewire fragment.[9] Therefore, prolonged attempts at percutaneous retrieval

should be avoided. If the wire fragment cannot be left in situ and attempts at percutaneous retrieval fail, surgical extraction was required in 43% of the cases reviewed by Al-Moghairi et al.[9]

Al-Moghairi et al highlighted the superiority of CT angiography in assessing vascular complications, showcasing its ability to visualize the trajectory of the guidewire accurately.[9] The integration of advanced imaging modalities becomes crucial in achieving a comprehensive understanding of the retained foreign body and guiding subsequent interventions. Strategies to prevent guidewire entrapment include maintaining proper wire positioning, avoiding excess angulation in the wire, and maintaining backward traction during stent advancement.[10]

The attempt to remove the entrapped guidewire by twisting with mild back-tension in this patient could have increased the chance of fracture of wire, aortic wall dissection, retained wire fragment, further dislodgement. Retained guidewire fragments in the coronary tree can lead to life-threatening complications such as perforation, dissection, vessel occlusion, thrombosis, and embolism.[11] A guide catheter can be wedged over the entrapped guidewire, followed by balloon inflation at the terminal part, thus trapping the wire. The whole system can then be retracted together. Operators can advance another guidewire and attempt to disentangle the entrapped guidewire by balloon inflation. A snare loop can be used to grasp the fragment, if a snare of appropriate size is available. Retrieval can also be attempted by twisting 2 or 3 guidewires around the retained fragment to trap it and then retracting all wires together. Hence, attempts at retrieval are warranted. Percutaneous removal should be attempted first; many techniques have been successfully employed.[11]

CONCLUSION

This case underscores the importance of vigilance in detecting and managing rare complications following interventional procedures. Prompt recognition and a collaborative approach to intervention are crucial for achieving successful outcomes. Continued efforts in quality assurance and procedural safety are imperative to minimize the occurrence of such complications in the future.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Hossain MF, Reza MS, Sarker SR, Mahmud S, Khan MA, Hoque MM, et al. Surgical management for a retained guidewire *in vivo* during percutaneous coronary interventions following acute myocardial infarction from descending thoracic aorta to external iliac artery: a case report. Int J Sci Rep 2024;10(3):92-4.