

IMAGES IN CARDIOLOGY

Strut fracture of the Convexo-Concave Björk-Shiley mitral valve prosthesis

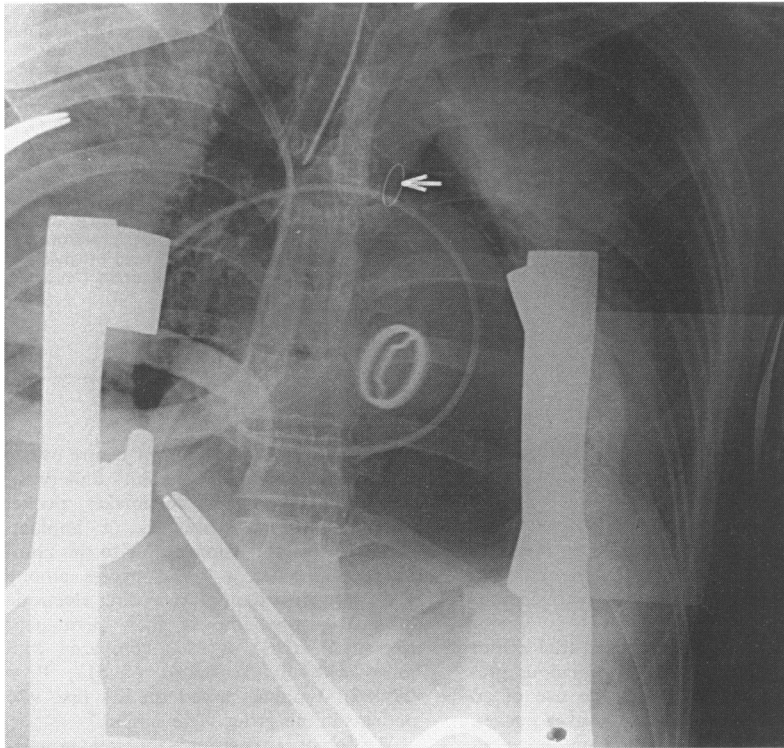


Figure 1 Intraoperative chest radiograph.

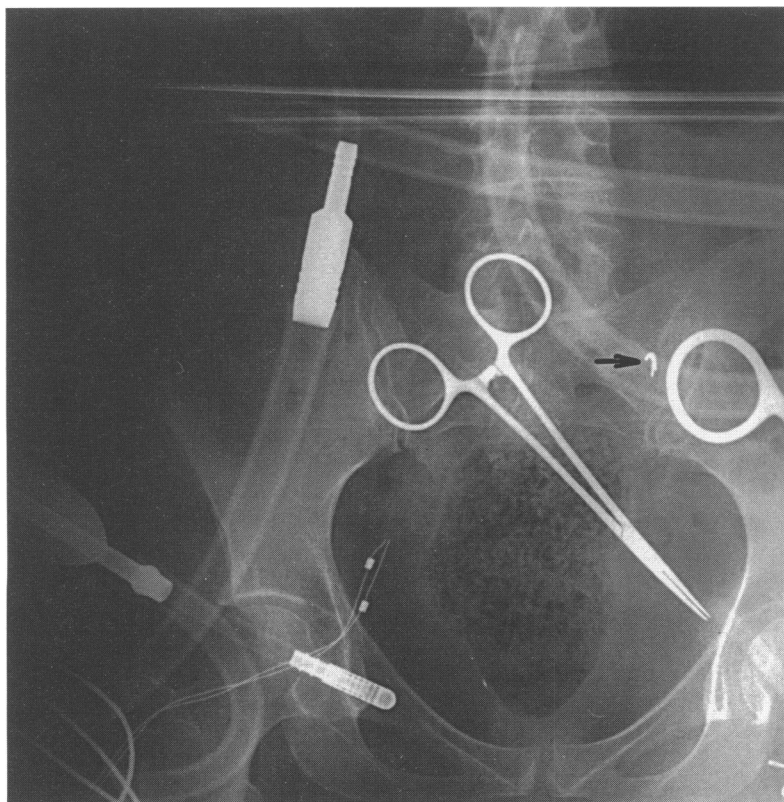


Figure 2 Intraoperative radiograph of pelvis.

Outlet strut fracture with embolisation of the occluder disc and outlet strut is a well-recognised complication of the 60° and particularly of the 70° Convexo-Concave Björk-Shiley valve prostheses. By November 1991 this complication had been reported in 466 of the 86 000 valves implanted worldwide. The risk is greatest for the larger sizes (29-33 mm), used in the mitral position, manufactured between July 1981 and June 1982.

Figure 1 is the intra-operative chest radiograph from a 54 year old woman with a 60° Convexo-Concave Björk-Shiley mechanical mitral valve prosthesis who presented with cardiovascular collapse. She became alarmed when her prosthesis stopped clicking. Strut fracture was diagnosed and she was taken for immediate surgery. The sewing ring of the prosthesis is clearly shown positioned in the mitral annulus. The dislodged pyrolite disc (arrowed) lies in the aortic arch. Figure 2 shows the fractured strut (arrowed), which had held the disc in place, now lying in the iliac artery.

The Björk-Shiley mechanical valve was introduced in 1969. Disc dislodgement has been a rare complication of early models, identified in only 3 of 90 000 valves implanted. Modification, to improve haemodynamic function and reduce thromboembolic complications, led to the introduction of the Björk-Shiley Convexo-Concave 60° valve. This was inserted into 82 000 patients worldwide between 1976 and its withdrawal in 1986. Subsequently the 70° Convexo-Concave valve was introduced. It was only marketed outside the United States and was inserted in 4000 patients between 1980 and 1983. The estimated annual incidence of outlet strut fracture with disc embolisation is 0.02 to 2.52%: it is much less often seen with other models. Subsequent introduction of a monostrut design with the ring and retaining strut milled from a single piece has apparently overcome this fault.

Most patients with Convexo-Concave valves in the United Kingdom have been notified of the risk of strut fracture and many carry Medic-Alert bracelets. If strut fracture is suspected, however, the most readily available and quickest investigation is an overpenetrated chest radiograph in both posteroanterior and lateral or oblique views. This may show absence of the strut or occluder disc or both from their usual position and possibly their location in another site. Immediate surgical intervention is the only treatment. It may result in complete recovery as it did with this patient who remains well one year after the event.

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