

## Historical note

# Coarctation of the aorta with dissecting aneurysm and haemopericardium: an account by Joseph Jordan, Manchester, 1830

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An article published in the first issue of the *North of England Medical and Surgical Journal* (1 August 1830) was entitled: "A case of obliteration of the aorta. By Joseph Jordan Esq., Surgeon to The Lock Hospital, Manchester."<sup>1</sup>

Joseph Jordan (1787-1873) was born in Manchester. He qualified in medicine and surgery at Edinburgh and then for a few years served as an army surgeon. In 1814 Jordan opened a school of anatomy in Manchester.<sup>2</sup> Referring to this period of his life, *The Lancet* in his obituary noted: "He was the first provincial lecturer and teacher [in anatomy] whose certificates were accepted and recognised in London."<sup>3</sup> An extract from the minutes of a meeting of the Court of Examiners, Society of Apothecaries, held on 19 April 1821, ran: "Some Testimonials having been presented on Thursday last, purporting to be the certificates of a Lecturer on Anatomy at Manchester. Mr Field a Member of this Court, with a view to ascertain whether these papers were authentic addressed a Letter to Dr Hull of Manchester and having received a very satisfactory answer as to Mr Jordan being a public Teacher of Anatomy there, the Court Resolved, 'That the certificates of Mr Joseph Jordan of Manchester as a Teacher of Anatomy shall be received by this Court as sufficient in respect to Anatomical Lectures'." (Guildhall Library Ms 8239/2, unfoliated.)

Jordan was a cofounder of and surgeon to the Lock Hospital, Manchester. In 1835 he was elected surgeon to the Manchester Infirmary. He had been a zealous teacher of anatomy for 20 years and surgeon to the Infirmary for 30 years.

Most of his career as an anatomist was before the Anatomy Act (1832). He had a self avowed involvement in "body snatching." The article under review is an early description of coarctation of the aorta, complicated by the development of a dissecting aneurysm of the ascending aorta, with rupture into the pericardium. The account was later discussed by Craigie in 1841<sup>4</sup> and Hamilton and Abbott in 1928<sup>5</sup>; Railsback and Dock in 1929<sup>6</sup> referred to one detail from Jordan's article, mentioned in Craigie's important review. Mitchell in 1984<sup>7</sup> mentioned the article in his excellent account of the life and career of Jordan.

In an extensive review of coarctation of the aorta, Barié (1886), referred to an account by

Otto (1824) of fatal rupture of the aorta into the pericardium associated with coarctation.<sup>8</sup> "Anéurysme disséquant de l'aorte" was described in detail by Laennec in 1826.<sup>9</sup> A sequence of extracts from Jordan's article<sup>1</sup> follows.

The peculiarities were found in the body of a man brought for dissection... the aorta appeared very much contracted, if not obliterated, immediately below the point to which the *ductus arteriosus* is fixed, and the very great size of the three arteries which arise from its arch, seemed to corroborate this opinion... it was evident, the blood being obstructed at the point aforesaid, had been thrown in to those three vessels, viz. *Arteria innominata*, the *left carotid* and *left subclavian*, which were greatly increased in diameter, particularly the subclavians, which, on comparison, exceeded the common iliacs... the first set of vessels which the subclavian gives off were enormously increased in size, but particularly the *arteria intercostalis superior* and the *internal mammary*.

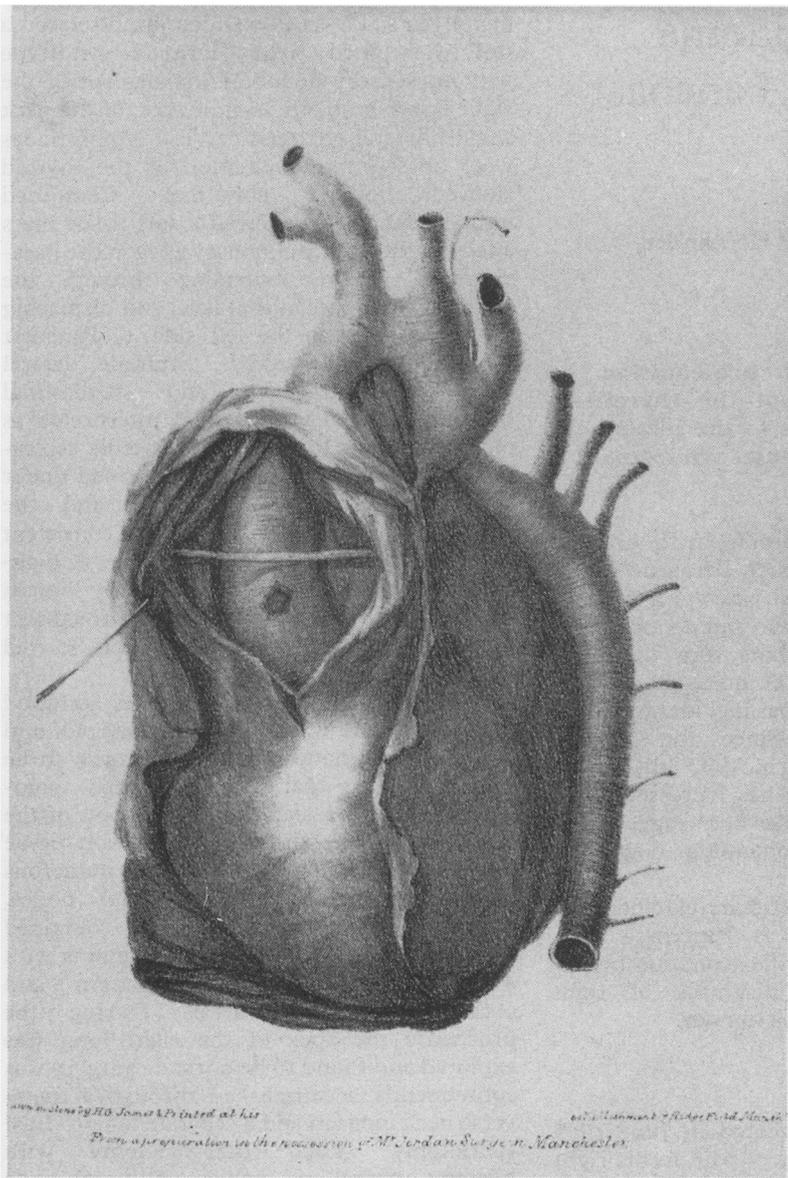
The *intercostalis superior* on each side equalled the femoral artery in size, took its usual destination, but had become remarkably tortuous and convoluted, dividing into several branches, some of which passed out of the chest behind the ribs, and descended amongst the muscles of the back to inosculate with the posterior branches of the intercostal arteries of the descending aorta. But the largest branches passed in front of the ribs, and terminated, by remarkable anastomoses, with the first and second intercostal arteries of the aorta, but particularly with the first. The ribs had become deeply absorbed and sulcated in some parts, by the pressure of the branches of this artery [the third and fourth intercostal arteries are the first and second of THE AORTA, respectively]. The *internal mammary* on each side was little inferior to the *brachial* in size. They took the usual course, and terminated in five or six branches, which were continued directly into the 5th, 6th, 7th and 8th intercostal arteries of the aorta; these latter arteries were greatly enlarged, and had become remarkably tortuous, and in some places convoluted on themselves...

The next enlarged collateral channel was the *infra-scapular* of the *axillary* artery, or a branch arising immediately below it. This was larger than the *ulnar* artery, ran down the side of the chest, under the *latissimus dorsi*, in a very tortuous manner, and terminated in the 7th and 8th intercostal arteries of the aorta. It was evident therefore that the chief collateral channels, by which the blood had passed from the aorta,

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Display of tear in the ascending aorta and the space where "the blood had insinuated itself between the fibrous tunic and the external or pericardial covering"; edges of the outer pericardium are also shown.

above the obliteration, to that vessel below it, were three,—viz. the *intercostalis superior* and *internal mammary* of the *subclavian*, and the *infra-scapular* of the *axillary* arteries on each side. The blood was transmitted by these to the eight superior intercostal arteries of the *aorta descendens*:—but chiefly into the three superior from the intercostal branch of *subclavian*,—and the three inferior of the eight from the *internal mammary*, and *infra-scapular*. The two intervening intercostals, however, were of considerable size. It is evident there must be a greater force required to propel the blood throughout these circuitous routes, than in the usual course and there must have been a greater pressure in the ascending aorta and its arch; and it seems probable that this was the cause of the aneurysm

of the aorta within the pericardium, which on bursting produced immediate death. The *pericardium* was found greatly distended, and, on being slit open, it proved to be blood, effused into its cavity . . . the aorta [was] increased to twice its usual size, its surface tense, shining, and of a bluish color, through its whole course from the heart to its exit out of the pericardium . . . the blood had escaped into the pericardium by a small fissure or crack at the right and posterior side . . .

An incision was made along the fore part of the aorta from the heart to its exit out of the pericardium, this, instead of laying open the aorta, exposed a cavity containing a quantity of firm coagulated blood . . . on removing this, the aorta was seen to pass through the centre of the cavity, and of its usual size . . . this proved to be the aorta deprived of its pericardial covering, consisting merely of an internal and fibrous coat, about the middle of its course an aperture was observable . . . this was the primary mischief, that the blood had passed through this crack, and insinuated itself between the fibrous tunic and the external or pericardial covering . . . [which] by this means had become separated, and dissected from it by the blood, and distended to such a degree, that it had at length given way itself, by the small opening allowing the blood to escape into the *pericardium* (PLATE I).

. . . The body having been raised for the purpose of dissection, we were precluded from seeking for information from his relatives. The only circumstances we could learn were, that he was 21 years of age, that he dropped down dead in the street. That he was a butcher by trade, and could lift heavy baskets of meat apparently as well as other men. . . .

Jordan's account of coarctation of the aorta: (a) gave clear anatomical details of the several systems of abnormal arterial anastomoses; (b) was one of the first to give precise details of an associated dissecting aneurysm with haemopericardium; (c) was the second to describe rib notching (Craigie pointed out that Meckel (1827) was the first to do so<sup>4</sup>); and (d) drew attention to a danger in the increase in blood pressure in the aorta proximal to the coarctation.

I thank Margaret Culliney, Dr F B Beswick and Mr Victor Tomlinson for their help.

- 1 Jordan J. A case of obliteration of the aorta. *North of England Medical and Surgical Journal* 1830;1:101–4.
- 2 Jordan FW. *Life of Joseph Jordan*. London: Sherratt and Hughes, 1904:17–73.
- 3 Anonymous. Joseph Jordan [obituary]. *Lancet* 1873;ii:790–1.
- 4 Craigie D. Instance of obliteration of the aorta beyond the Arch, illustrated by similar cases and observations. *Edinburgh Medical and Surgical Journal* 1841;56:427–62.
- 5 Hamilton WF, Abbott ME. Coarctation of the aorta of the adult type. *Am Heart J* 1928;3:381–421.
- 6 Railsback OC, Dock W. Erosion of the ribs due to stenosis of the isthmus (coarctation) of the aorta. *Radiology* 1929;12:58–61.
- 7 Mitchell GAG. Joseph Jordan. In: Elwood WJ, Tuxford AF, eds. *Some Manchester doctors*. Manchester: Manchester University Press, 1984:65–74.
- 8 Barié E. Du rétrécissement congénital de l'aorte descendante. *Revue de Médecine* 1886;6:348.
- 9 Laennec RTH. *Traité de l'auscultation médiate*. Tome II. Paris: Chaude, 1826:696–708.