DIVERTICULUM OF THE LEFT VENTRICLE

. REPORT OF A CASE

BY

EL-SAYED EL-AKKARI, M. KAMAL BADR EL-DIN, and A. SAMIR KASSEM

From the Faculty of Medicine, Alexandria University, Alexandria, U.A.R.

(RECEIVED FOR PUBLICATION JANUARY 5, 1965)

Congenital diverticulum of the left ventricle of the heart is considered to be a rare malformation. Up to 1958, Keith, Rowe, and Vlad could only collect 13 cases from the published reports. Successful operations had been recorded by Roessler (1944), Skapinker (1951), Potts, DeBoer, and Johnson (1953), and Mustard, Duckworth, Rowe, and Dolan (1958).

The purpose of this paper is to present the clinical angiocardiographic, surgical, and pathological data in an infant with congenital diverticulum of the left ventricle of the heart.

Case Report

A boy aged 4 days was admitted to the hospital on February 2, 1964, presenting with a pulsating mass inside a huge ventral hernia. He had been born at full term, the product of a normal gestation and spontaneous delivery. Parents were first cousins.

Physical examination revealed a non-cyanotic infant, in no distress, weighing 3,700 g. There was no clubbing of the fingers or toes. The respiratory rate was 40 a minute, and the pulse rate was 130 a minute. The radial and femoral pulsations were normal. The blood pressure in the right arm was 75/50 mm Hg.

Clinical examination of the heart revealed no praecordial bulge. The apex was in the 5th left intercostal space, one finger's breadth inside the nipple line. There were no other pulsations over the praecordium and there were no thrills. Auscultation revealed a soft systolic murmur, grade 2/6, heard maximally over the lower part of the sternum and down over the pulsating mass.

Abdominal examination revealed a huge ventral hernia extending from the xiphoid process to the umbilicus (Fig. 1). The skin covering it was thin and deeply pigmented. The hernia was bulging through a huge defect in the anterior abdominal wall, and at the upper part of the hernia a pulsating tubular mass (3 x 1.5 cm.) was seen protruding out just below the xiphisternum. Its pulsations were synchronous with those of the heart, and firm pressure on it provoked extrasystoles.

The liver was not enlarged and the spleen was not palpable.

Radiography revealed that the soft tissue shadow of the pulsating mass was continuous with the cardiac shadow (Fig. 2).

Electrocardiogram revealed right axis deviation, and vertical heart, the praecordial leads showing evidence of right and left ventricular hypertrophy.

Operation was postponed for about three weeks because of mild umbilical sepsis. During this time there was an increase in the size both of the ventral hernia and of the pulsating mass. The infant was operated on at the age of 1 month, the operation being done under general anaesthesia with fluorothane, nitrous oxide, and oxygen. Exploration was performed through a hockey-stick thoraco-abdominal incision extending from the left nipple through the 5th intercostal space down to the xiphoid process and extending in the middle line to the umbilicus. Dissection of the upper part of the hernia revealed the presence of a diverticulum of the heart which was covered by pericardium only on its anterior surface. The diverticulum was bulging through a defect between the two slips of the diaphragm arising from the xiphoid process. The ventral hernia was covered with a peritoneal sac independent from the diverticulum.

Operative angiotherapy revealed the continuity of the diverticular cavity with that of the left ventricle. It also demonstrated the simultaneous opacification of the aorta and the pulmonary artery. The pericardial covering was dissected from the diverticulum, and a Potts clamp was applied to its base at its junction with the left ventricle. During the application of the clamp the electrocardiogram revealed a temporary bradycardia with evident S-T change which returned to normal after removal of the clamp. The diverticulum was excised and the base was stitched by interrupted mattress suture; the endocardium was closed; the muscle coat was sutured in another layer; the clamp was released and the sutures were made watertight. The defect in the diaphragm was easily closed by interrupted silk sutures. The chest was closed leaving a drain. The electrocardiogram showed changes in the S-T segment when the diverticulum was cut, and these...
part measuring about 12
neous
endothelium.
elastic
fibres,
cardiac
muscle
passed smoothly,
and
revealed
and the
congenital
cardiac diverticulum,
that the main bulk
was
excised
and abdominal exploration did not reveal any
gastro-intestinal
anomaly. The contents were reduced
and the defect in the anterior abdominal wall was closed.
Half an hour after the end of the operation, which
passed smoothly, sudden ventricular fibrillation developed
and the child died soon afterwards.

Necropsy. Apart from the diverticulum the heart
revealed a huge ventricular septal defect in the membra
eous part measuring about 12 mm. in diameter.
Histological examination of the diverticulum revealed
that the main bulk of the diverticular wall was made up
of cardiac muscle fibres arranged in all directions in which
neither Purkinje fibres nor nodal tissue was seen. The
framework was made up of connective tissue rich in
elastic fibres, and the diverticulum was lined with
endothelium. The outside covering was a serous
membrane with subpericardial connective tissue rich in
fat cells and containing numerous blood vessels.

Comment

In this case, apart from the presence of a true
congenital cardiac diverticulum, there were other
congenital abnormalities, namely, defects in the
basilar pericardium, and in the ventral portion of the
diaphragm, and a huge defect in the anterior abdomi
nal wall. The association of these congenital anomalies confirms the suggestion of Potts et al.
(1953) that the condition is primarily due to some
abnormality of the septum transversum. This latter
normally gives rise to the basilar portion of the
pericardium, the ventral leaf of the diaphragm, and
the ventral cephalic part of the abdominal wall
(Politzer and Sternberg, 1930; Margulies, 1945).
During development the epicardium of the cardiac
loop fuses to the ventral leaf of the septum trans
versum, and as the latter descends the attached
epimycardium is pulled ventrally and caudally and
a true congenital diverticulum results.

The high mortality in the reported infants who
were not corrected by surgery warranted early
operation. Although this was completed success
fully, ventricular fibrillation set in soon afterwards
and the child died.

It seems advisable to manage this type of case in
two stages, first to excise the diverticulum and later
to deal with the ventral hernia. The correction of
the latter in the same stage may put too much strain
on the heart, especially in the presence of intracardiac
defects.
REFERENCES


S. el-Akkari, M. K. el-Din and S. Kassem

Arch Dis Child 1965 40: 545-547
doi: 10.1136/adc.40.213.545

Updated information and services can be found at: http://adc.bmj.com/content/40/213/545.citation

Email alerting service

These include:
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to: http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to: http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to: http://group.bmj.com/subscribe/