Medicine in the Elderly

The successful surgical repair of a ruptured interventricular septum following a myocardial infarct in an 89 year old man

Richard M. Grocott-Mason¹, Anthony Yates² and Richard Wray

¹King's College Hospital, Denmark Hill, London, SE5 9RS, ²Guys Hospital, London and ³St Helen's Hospital, Hastings, UK

Summary: This case report describes the successful repair of an acquired ventricular septal defect following an anterior full thickness myocardial infarct in an 89 year old man. Four months after the infarct the patient was in severe congestive cardiac failure (NYHA Class IV), despite medical treatment, with signs of a ventricular septal defect. This was confirmed by echodoppler and cardiac catheterization. Surgical repair of the ventricular septal defect was performed. He made an un-complicated recovery and two and a half years later is well and active. We believe he is the oldest patient who has had this operation successfully.

Introduction

Rupture of the interventricular septum occurs in approximately 1% of patients some 5 to 7 days after a transmural myocardial infarct.¹ Surgical closure is the standard treatment. We report the successful surgical repair of a ruptured interventricular septum following an anterior myocardial infarct in an 89 year old man, leading to a marked improvement in his quality of life. We believe he is the oldest patient to have had such an operation successfully.

Case report

An 89 year old professional musician, was first seen in March 1987. He had a 2 week history of a chest pain and shortness of breath on minimal exertion.

On examination he was breathless on minimal exertion. Heart rate was 90/min regular. Blood pressure was 140/80 mmHg. Jugular venous pressure was raised at 4 cm. At the apex and left sternal edge there was a grade 4/6 pansystolic murmur and a soft third heart sound. Fine basal inspiratory crepitations were present. He had hepatomegaly but no peripheral oedema.

Electrocardiogram showed sinus rhythm with a recent extensive anteroseptal myocardial infarct. A chest X-ray showed cardiomegaly with some pulmonary oedema. An echocardiograph the following month revealed a dilated left ventricle, which contracted reasonably well. The apical third of the septum was thin, akinetic and aneurysmal. There was a flow across the interventricular septum of 3 m.s⁻¹ detected on Doppler. He had some calcification of both the aortic and mitral valves with trivial mitral regurgitation.

He was treated with diuretics and digoxin but over the next 4 months progressively deteriorated. Despite increased medical therapy he steadily developed gross peripheral oedema, involving his legs and lower abdomen. He was in the New York Heart Association Functional Class IV. In July 1987 he was referred for consideration of surgical repair of his ventricular septal defect.

Right and left heart catheterization was performed. Left ventriculography confirmed an extensive apical infarct with a ventricular septal defect. The left anterior descending artery was occluded. Both the circumflex and the right coronary arteries were patent with no significant stenoses. Right atrial oxygen saturation was 50% and right ventricular oxygen saturation was 75%. The pulmonary artery pressure was 85/20 mmHg with a mean of 35 mmHg. Left ventricular end diastolic pressure was 20 mmHg.

The shunt size was calculated at 1.63:1. Following the catheterization he was treated with dobutamine and intravenous frusemide. His urea had increased to 15 mmol/l. Four days later, at the age
of 89 years and 17 days, he underwent surgical
correction of his ventricular septal defect.

The operation was performed via a routine
median sternotomy incision. There was a bifid
apical left ventricular aneurysm, with an extensive
old anterior left ventricular infarct. The aneurysm
was excised leaving a defect in the left ventricle
about 5 cm long. The ventricular septal defect was
identified as a 1.5 cm diameter hole in the anterior
part of the interventricular septum. This was closed
with an elastic Dacron patch. The defect in the left
ventricular wall was closed by direct suture.

Immediately post-operatively his pulmonary artery
pressure had reduced to 20/3 mmHg.

He made steady progress postoperatively. By the
fifteenth postoperative day he was able to climb a
flight of 10 steps independently.

His subsequent progress has been excellent. It is
now almost 3 years since his operation and the
patient is extremely active and well. Now, nearly
92, he drives to Spain, where he spends several
months of the year, and his only medication is
20 mg frusemid daily.

Discussion

The first successful surgical repair of a postinfarction
ventricular septal defect was performed by
Cooley et al in 1957. The patient was a 49 year old
male, operated on 11 weeks after an inferior
myocardial infarct. After excellent initial progress
the patient died after 45 days. Since this time
surgery has come to be the standard treatment for
this condition. With medical treatment less than
20% survive 1 month.

Once the surgical technique was established
there was a lot of debate over the timing of the
operation. In the early years the operation was
electively delayed until 3–6 weeks following rupture
of the septum. This produced good perioperative mortality rates of 10% and less. However,
many patients either died before they had surgery
or had serious complications. The recent trend has been towards early surgery. This has a higher
perioperative mortality (~30%) but avoids many of
the complications of prolonged circulatory collapse, such as renal failure, limb ischaemia
secondary to intra-aortic balloon pumping, pneumonia and pressure sores. The most important
prognostic indicator is the pre-operative haemo-
dynamic state – hypotension, pulmonary oedema,
renal failure and poor peripheral perfusion are all
poor prognostic signs.

Most of the statistics and reports on surgery for
postinfarction ventricular septal defects are related
to patients under 75. As cardiac surgery has advanced it has become clear that it is a suitable
mode of treatment for the elderly. A recent review
of over 100 cardiac operations on octogenarians
has revealed a perioperative mortality of only 2%
for elective coronary artery bypass grafting. The
overall mortality for cardiac surgery in octo-
genarians was 16% (10% for elective operations
and 29% for urgent operations). Mortality was
highest for patients needing preoperative inotropic
support, intra-aortic balloon pumping and for
those having a mitral valve replacement, either
alone or in combination with revascularization or
an aortic valve replacement. Only 29% of patients
had an entirely uncomplicated post-operative
course – the most frequent complication was atrial
arrhythmia. Cerebral ischaemic events occurred in
20% of patients during their hospital stay. Over
two thirds of these were transient. All patients with
non-transient defects died. Of those patients who
left hospital, 82% were alive at 2 years. The New
York Heart Association functional class of patients
was improved from a mean of 3.0 pre-operatively
to 1.8.

We are not aware of any reports in the literature
of the surgical closure of a ventricular septal defect
in any octogenarian patient. This case report shows
that it is possible for very elderly patients, if
appropriately selected, to survive major cardiac
surgery and to derive enormous benefit. We feel
that patients who develop ventricular septal defects
after acute myocardial infarcts should not be
denied surgical treatment on the basis of age alone.
Whether elderly patients should also be considered
for acute high risk intervention must be up to the
individual surgeon and physician to consider the
patient’s wishes and their general condition. All the
evidence suggests that pre-operative haemody-
namic state is by far the most important prognostic
determinant and that age is much less important.
A thorough assessment of cerebrovascular circula-
tion and the avoidance of nephrotoxic drugs is
important. Surgery in this age group does not
require long stays in hospital. Our patient stayed 10
days post-operatively at the regional centre and a
further 1 weeks convalescence at the local hospital.
In the St Louis study the mean hospital stay was 14
days.

Our patient had selected himself into a relatively
good prognostic group by surviving for more than
4 months with a ventricular septal defect acquired
after an acute myocardial infarct. He was able to
have a semi-elective operation which removed two
mechanical causes for his cardiac failure. There are
no data on the incidence of this particular problem
in this age group and no other reports of surgical
treatment. This report demonstrates how success-
ful surgery can be in appropriately selected octo-
genarians.
References


The successful surgical repair of a ruptured interventricular septum following a myocardial infarct in an 89 year old man.

R. M. Grocott-Mason, A. Yates and R. Wray

doi: 10.1136/pgmj.67.788.565

Updated information and services can be found at:
http://pmj.bmj.com/content/67/788/565

These include:

**Email alerting service**

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/