Case report

Left atrial giant thrombus infected by Escherichia Coli. Case report
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Abstract

Background: Left atrial thrombi are mostly related to mitral valve disease. The differential diagnosis of clots and myxomas in the left atrium is mostly based on echocardiography. Infection of intracardiac thrombi is extremely rare and mostly reported in ventricular clots or aneurysms following myocardial infarction.

Case presentation: We present the case of a 65 year old female with a history of mitral valve disease and chronic atrial fibrillation who suffered repeated embolic strokes and a giant infected clot in the left atrium. Although the patient underwent prompt surgery with removal of the clot and valve replacement the complication of septic emboli to the CNS led her to death. To the best of our knowledge this is the second report of an infected left atrial thrombus.

Conclusion: The case is a representative example of a neglected and undertreated patient with catastrophic consequences. Anticoagulant therapy in patients with mitral valve disease and atrial fibrillation should be applied according the currently available guidelines and standards in order to avoid analogous paradigms in the future. Mitral valve substitution should be considered in patients with mitral valve disease presenting thromboembolic complications. Surgery should be considered as the treatment of choice in cases of organized left atrial thrombus and suspected tumor or infected mass.

Background

Cardiac mural thrombosis is a complication of mitral valve disease frequently related to systemic thromboembolism. Infected intracardiac thrombi are extremely rare and mostly reported in ventricular chamber. So far there has been only one case of an infected thrombus in the left atrium [1]. This report describes the case of a patient with a history of mitral valve disease and atrial fibrillation with repeated embolic strokes in the past presenting a giant infected clot in the left atrium. Although the patient underwent surgery and removal of the clot the frequency and the severity of the strokes along with the complications of septic emboli to the CNS led her to death.
**Case presentation**

A 65 year old woman was admitted to our hospital with disturbances of consciousness ensued during the last two days. She had been suffering from mitral stenosis for 15 years and was under medical supervision, receiving digoxin, furosemide and warfarin. She had suffered three embolic strokes over the last 5 years. At present the first clinical examination revealed Glasgow Coma Scale (GCS) of 6, left hemiplegia, atrial fibrillation, low blood pressure of 70/40 mmHg and temperature of 38.5°C. With the diagnosis of an imminent stroke the patient underwent emergency CT scan of the brain and thorax. Brain scan disclosed extensive ischemic damage to the right brain hemisphere (Figure 1), compatible with preexisting lesions. The CT of the thorax revealed an enlarged left atrium and the existence of a distinctly outlined mass of 10.3 cm × 6.3 cm × 6.5 cm in the left atrium (Figure 2) Echocardiography confirmed the presence of the mass and severe mitral valve stenosis with valve opening of <1 cm² (Figure 3).

The patient was urgently referred to our cardiac surgery department with the differential diagnosis of a giant left atrial thrombus or left atrial myxoma and underwent removal of the mass through a transatrial approach. The mass was locally semi-liquid and foul-smelling, giving the impression of a huge infected thrombus (Figure 4). The mitral valve was severely calcified and was replaced by a metallic prosthetic valve.

Histological examination confirmed the diagnosis, revealing clot material with numerous polymorphoneuclear cells (Figure 5). The extracted mitral valve also revealed minor inflammatory infiltration (Figure 6). Blood and specimen cultures grew Escherichia Coli, with multisensitivity profile, compatible with community-acquired infection.

She was admitted to the ICU in a state of shock and anuria, receiving high doses of inotropic drugs and antibiotic treatment with ceftriaxone, gentamycin and metronidazole. She was also put under full anticoagulant therapy. A new transoesophageal echocardiogram in the 7th post-operative day disclosed recurrence of thrombus remnants in the left atrial appendage. After 10 days she was weaned...
of the inotropic drugs and the veno-venous hemofiltra-
tion, and 15 days later she was also weaned of the ventila-
tor. The patient during this period was afebrile. After 3
days of spontaneous breathing she had to be re-intubated
because of progressive respiratory insufficiency due to
intervening further neurological deterioration and fever
reappearance. Lumbar puncture revealed findings consist-
ent with a central nervous system infection, probably due
to septic emboli. Antibiotic treatment was then switched
to meropenem, but it was unsuccessful. The patient died
5 days later due to brain stem herniation.

Discussion
Left atrial thrombi associated with mitral valve disease
represent significant risk factor for systemic thromboemb-
obolism and sudden death [2]. Such sizable thrombi as the
one we present have sometimes been mentioned in case
reports [3-5] but only one case described by Fukuchi et al
[5] refers to a patient receiving continuous anticoagulant
therapy.

Diagnosis is often made with chest computed tomogra-
phy as in our case although transoesophageal or 3-d tran-
sthoracic echocardiogram are known to be superior in
identifying left atrium masses and clarifying the diagnosis
between thrombus and left atrial myxoma [6-8]. Cardiac
MRI is comparable to TEE in the detection of atrial
thrombi, especially in the left atrial appendage, but it is
time consuming and carries a high cost precluding its use
as a routine procedure [9].

Definite diagnosis requires histological confirmation, as
there have been some case reports describing develop-
ment of atrial myxoma in the setting of an already existing
mitral stenosis [7,10]. Therefore surgery should always be
considered in these patients if the differential diagnosis
between myxomas and clot in the left atrium is not possi-
ble despite the use of echocardiogram and CT scan.

Another indication for surgical treatment is the infection
of the clot as in our patient. Conforming to our manage-
ment Okayama et al reported surgical management of an
infected left atrial thrombus in a male patient who wasn’t
under anticoagulant therapy [1]. The kind of microorgan-
ism causing the infection is commented on by the authors
in this last case as being similar to other reports, referring
mainly to infected ventricular thrombi. As there are no
reports about gram-positive intracardiac thrombus infec-
tions, it is probable that the natural history and related
pathogens differ from native or prosthetic valve infec-
tions. Surgery should also be undertaken if an organized
thrombus is identified at the echo examination since con-
servative management with anticoagulants may lead to an
unpredictable pattern of thrombus resolution and forma-
tion of fragments that may result in systemic emboli [11-
13].

Medical therapy consisting in anticoagulants has been
proposed for sessile, immobile thrombi presenting less
risk for thromboembolic complications in candidates for
percutaneous transvenous mitral commissurotomy [14].
Thrombolytic therapy as well as anticoagulant could be
used only for unorganized thrombi [15]. So far there have
been few reports of thrombolytic therapy for left atrial
thrombi in the literature [15,16].

Large atrial thrombi are very rare as the incidence of native
valve disease tends to be reduced and the anticoagulant
therapy is evolving and becoming more standardized
[17]. Additional infection of a thrombus is even rarer, as
guidelines about the use of prophylactic antibiotics in this
group of patients are now generally applied.

Conclusion
The case report presented is a representative example of a
neglected and undertreated patient in refers to both surgi-
cal and medical aspects of her disease with extreme com-
plications. In order to avoid such references in the future
anticoagulant therapy must be used according to the cur-
rently recommended guidelines and standards and sur-
gery must be considered in the setting of mitral valve
disease complicated by systemic thromboembolism. In the
presence of left atrial thrombus surgery should be offered
in all patients with organized thrombus or suspicion of a
tumor or an infected mass.

List of abbreviations
CNS: Central Nervous System. GCS: Glasgow Coma Scale.
Figure 5
Histology specimens of the thrombus. 1. Inflammatory material from left atrium ventricle (H-E ×40), 2. Thrombotic material from the same area (H-E ×40), 3. Deposits of calcium salts (H-E ×40), 4. Necrotic alterations (H-E ×40), 5. Absence of microorganisms (Histochemical Grocott-Gomori stain) (×40), 6. Absence of microorganisms (Histochemical Giemsa stain) (×40).
Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
All authors: 1) have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) have been involved in drafting the manuscript or revising it critically for important intellectual content; and 3) have given final approval of the version to be published.

References

Figure 6
Mitral valve histology specimen. Mitral valve with degenerative alterations (H-E x40).