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Case Report

Balancing Thrombotic and Haemorrhagic Risk: Management of ST-Elevation Myocardial Infarction in a Frail Elderly Patient with Concurrent Acute-on Chronic Subdural Haematoma

Xheme Ilazi[1], Mesharck Gariba[2], Prab Bains[1], Osato Asemota-Igbinovia[3], Olanrewaju Saheed[2] and Rutvee Patel[2]*

[1]*Calderdale and Huddersfield NHS Foundation Trust, England*

[2]*Bedford Hospital Trust, England*

[3]*University Hospital of Cleveland-Ohio, USA*

Abstract

The management of acute ST-Elevation Myocardial Infarction (STEMI) in patients with concomitant intracranial haemorrhage is challenging due to competing thrombotic and haemorrhagic risks. Evidence guiding the use and timing of Dual Antiplatelet Therapy (DAPT) is limited, as such patients are excluded from major clinical trials. We report the case of an 89-year-old frail woman who presented following an unwitnessed fall and was found to have an acute STEMI alongside right-sided subdural haematoma involving the temporal lobe. She was managed conservatively following multidisciplinary discussion. Despite initial stability, she was readmitted with a large acute-on-chronic subdural haematoma and arrhythmia. This case highlights the importance of individualised decision-making, multidisciplinary collaboration, and careful balancing of risks when managing antiplatelet therapy in patients with concurrent life-threatening conditions.

Keywords: Acute Coronary Syndrome and Intracranial Haemorrhage; Antiplatelet Therapy Management; Thrombotic-Haemorrhagic Risk Balance

Introduction

ST-Elevation Myocardial Infarction (STEMI) is a medical emergency requiring prompt reperfusion and initiation of DAPT to reduce the risk of death [1]. However, the presence of Intracranial Haemorrhage (ICH) significantly complicates management due to the risk of haemorrhage expansion. Patients with active intracranial bleeding are routinely excluded from major randomised trials evaluating antiplatelet therapy and reperfusion strategies, resulting in a lack of clear clinical guidance.

Subdural Haematoma (SDH) is common in older adults, particularly in those with cerebral atrophy, recurrent falls, or exposure to antithrombotic therapy [2,3]. Acute-on-chronic SDH may progress insidiously, and is susceptible to expansion, especially in the context of antiplatelet therapy. On the other hand, an early disruption of the antiplatelet therapy following STEMI, could expose patients to a substantial risk of further ischemic event [4]. Current international guidelines primarily address the acute management of ICH and provide limited direction regarding the initiation, continuation, or resumption of antiplatelet therapy in patients with concurrent high risk cardiovascular disease.

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***Corresponding author:** Gariba M, Bedford Hospital Trust, England*

We describe a complex case of an elderly patient presenting with STEMI in the context of recent intracranial bleeding, recurrent falls, and evolving cardiac conduction abnormalities. This case highlights the challenges of antiplatelet decision-making at the cardiology neurosurgical interface, the importance of multidisciplinary and patient-centred care as well as reviews the limited evidence informing antiplatelet management following ICH.

Case Presentation

An 89-year-old woman was brought to the Emergency Department following an unwitnessed fall and head injury. There were no prodromal symptoms or focal neurological deficit. Past medical history includes T2DM (on metformin), osteoarthritis and hip replacement. No other significant drug history, and no known medication allergy.

Initial blood tests revealed a markedly elevated troponin T level of 900 ng/L, rising to 2,500 ng/L. A standard electrocardiography demonstrated ST-segment elevation in the anterior leads, consistent with acute STEMI. A Computed Tomography (CT) of the head showed a shallow (~4 mm) right-sided SDH involving temporal lobe. Given the patient's advanced age, frailty, and high risk of ICH expansion, she was considered not suitable for primary percutaneous coronary intervention. Therefore, following multidisciplinary discussion with cardiology and neurosurgery teams, and in accordance with patient and her family wishes, medical management was initiated including DAPT - aspirin and clopidogrel. Additional secondary prevention therapy included Angiotensin-Converting Enzyme (ACE) inhibitors, beta blockers and statin. The patient remained medically optimised for discharge, and she was subsequently discharged home with the above medical management.

Three months later, she was readmitted following multiple vacant

episodes and numbness of left upper and lower limbs. On admission, neurological examination did not reveal any significant abnormalities, except her subjective left sided numbness. She had an urgent CT head, which, compared to previous imaging, showed an acute-on-chronic right SDH measuring approximately 19 mm with a midline shift of 11 mm (Figure 1). DAPT was withheld, and neurosurgical intervention was deemed inappropriate due to poor operative candidacy.

During this admission, prolonged cardiac monitoring identified a second-degree of atrioventricular block. Following cardiology advice, beta-blocker therapy was discontinued. Prior to discharge, a low dose mono-antiplatelet therapy (aspirin) was reintroduced. A cardiology follow-up was arranged to monitor patient post-discharge.

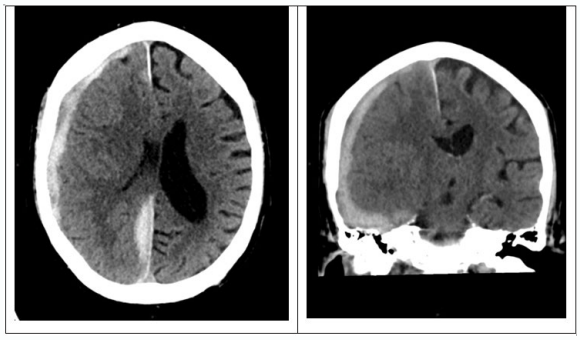

Figure 1: CT head (axial and coronal view): Right Subdural Haematoma measuring approximately 19mm with a midline shift of approximately 11mm (Adopted image [5])

Discussion

The co-occurrence of Acute Coronary Syndrome (ACS) and ICH, as illustrated in this case, represents a rare but significant therapeutic dilemma. Standard management STEMI prioritises rapid coronary reperfusion and initiation of DAPT to reduce mortality and reinfarction risk [6,7]. However, in the presence of active intracranial bleeding, aggressive antithrombotic therapy is traditionally contraindicated and patients with acute or recent ICH have therefore been excluded from landmark antiplatelet and percutaneous coronary intervention trials, resulting in a limited evidence base to guide management in scenarios such as this [8]. Consequently, the decision to resume antiplatelet therapy following an episode of ICH, as required in our patient, remains clinically challenging.

This uncertainty is reflected in current international guidelines. The recommendations from the American Heart Association/American Stroke Association (AHA/ASA) and the European Stroke Organisation (ESO) guidelines focus primarily on acute ICH management, emphasising neurological monitoring and repeat imaging guided by clinical deterioration rather than routine surveillance imaging in stable patients [9,10]. While these principles informed the neurological management in this case, they provide little guidance on how to manage the competing cardiovascular risks associated with withholding antiplatelet therapy.

On the other hand, cardiology guidelines recommend an individualised approach that balances ischaemic benefit against bleeding risk. The 2023 European Society of Cardiology (ESC) guidelines for the management of ACS recommend risk stratification using tools such as the Academic Research Consortium High Bleeding Risk (ARC-HBR) criteria, with consideration of shorter durations of DAPT in patients of high risk of bleeding [6].

In addition, the 2020 National Institute for Health and Care Excellence (NICE) guideline on acute coronary syndrome recommends aspirin monotherapy for patients with STEMI who are not undergoing percutaneous coronary intervention and are considered to be at high risk of bleeding [7].

Although the above guidelines provide recommendations on duration of antiplatelet therapy and strategies for patients at high bleeding risk, they offer limited guidance regarding the optimal timing of antiplatelet resumption in patients presenting concurrently with ACS and ICH, highlighting an important evidence gap in the management of complex cases such as this.

A systematic review and meta-analysis of 10 studies with 5554 patients evaluating antiplatelet resumption after spontaneous intracerebral haemorrhage found no significant increase in recurrent haemorrhage among patients who restarted antiplatelet therapy and suggested a potential reduction in major vascular events [11]. However, most patients resumed therapy weeks to months after the index haemorrhage, limiting the applicability of these findings to patients requiring early antiplatelet treatment for concurrent ACS.

Similarly, a clinical trial RESTART (REstart or STop Antithrombotics Randomised Trial) demonstrated that restarting antiplatelet therapy after spontaneous intracerebral haemorrhage was not associated with a significant increase in recurrent bleeding [12]. Although these findings provide reassurance regarding the safety of antiplatelet resumption, their relevance to our case is limited because patients with traumatic subdural haematoma were excluded from trial and the timing of antiplatelet reintroduction varied considerably among participants.

In this case, clinical decision making was complicated by patient specific factors. In frail older adults, the presence of recurrent falls, cognitive impairment, and reduced physiological reserve heighten the challenge of balancing cardiovascular benefit against haemorrhagic risk. These considerations highlight the need for individualised, multidisciplinary assessment that integrates neurological stability, cardiovascular risk, frailty, and overall goals of care when managing the uncommon coexistence of ACS and ICH.

Within this broader context, the adjustment of antiplatelet therapy for this patient required careful evaluation of competing priorities. The ST elevation myocardial infarction conferred a substantial risk of recurrent ischaemia if antiplatelet therapy were withheld, whereas the intracranial haemorrhage created an immediate bleeding threat that precluded standard DAPT. In accordance with ESC and NICE guidance for high bleeding risk patients, a modified antiplatelet regimen was therefore selected. Neurological stability on serial examination, consistent with AHA/ASA and ESO recommendations, supported close clinical monitoring rather than routine repeat neuroimaging.

This management approach reflects a pragmatic balance in the absence of definitive evidence, aiming to prevent life threatening coronary events while minimising the risk of haemorrhagic progression. Although randomised data such as the RESTART trial and observational studies suggest that antiplatelet resumption after ICH is generally safe, their relevance to trauma related haemorrhage in the context of concurrent STEMI is limited. This case highlights the importance

of multidisciplinary discussion, rigorous risk stratification, and patient centred decision making, as well as the need for further research to guide practice in this high risk clinical scenario.

Conclusion

This case illustrates the complex relationship between thrombotic and haemorrhagic risk in older adults presenting with concurrent ACS and ICH. While DAPT substantially reduces mortality following STEMI, it simultaneously increases the likelihood of intracranial bleeding progression. The initial decision to discharge the patient on DAPT was informed by her significant cardiovascular risk, the absence of neurosurgical options, and radiological stability on early imaging.

Following readmission with an acute on chronic right subdural haematoma, the decision to reintroduce a low dose of mono antiplatelet therapy was guided by ESC and NICE recommendations for patients at high bleeding risk. Ongoing management required an individualised approach, incorporating neurological reassessment, repeat neuroimaging when clinically indicated, and transparent communication with the patient and her caregivers regarding anticipated risks, therapeutic benefits, and overall prognosis.

This case further highlights the essential role of multidisciplinary collaboration including cardiology, neurosurgery, geriatrics, and family involvement when navigating complex, high risk presentations where robust evidence is lacking. It also reinforces the need for further research to inform evidence based management strategies for patients with simultaneous ACS and ICH.

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