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CLINICAL SPOTLIGHT

Open Heart Surgery with Intracranial Meningioma: Case Report & Literature Review

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Meningiomas are generally considered slow growing tumours of arachnoid cell origin which remain asymptomatic for a long period of time and are usually managed conservatively by serial radiological follow-up. Only those lesions which show a potential for rapid growth are considered for surgical resection. Coronary artery bypass surgery usually involves use of cardiopulmonary bypass which incites varying degrees of systemic inflammatory response. Although some meningiomas are recognised by secretion of vasoactive substances leading to peri-lesion oedema, very little is known about the behaviour of asymptomatic meningiomas during a normal run of cardiopulmonary bypass where there is a significant rise in the plasma level of many vasoactive substances. We report the case of a 68 year-old male patient with asymptomatic meningioma who required urgent coronary artery bypass surgery leading to peri-lesion oedema and significant post-operative morbidity due to reversible neurological deficit.

Keywords Intracranial meningiomas • Coronary artery bypass grafting • Post-operative stroke • Vasogenic cerebral oedema • Cardiopulmonary bypass • Systemic inflammatory response

Introduction

The population of patients requiring open-heart surgery is progressively aging and the incidence of known and undiscovered co-morbid factors is also increasing. As intracranial meningiomas are usually slow growing tumours in the elderly, most of these patients are treated conservatively. However, if a patient with a known intracranial tumour requires cardiac surgery with the use of cardiopulmonary bypass, there is increased incidence of neurological complications and the intra-operative management becomes very crucial. Conversely, a previously undetected meningioma may lead to neurological morbidity in the absence of a cerebrovascular accident in the post-operative period of a cardiac surgical patient. Mass-effect due to peri-tumoural oedema has been observed in some patients with potential reversibility and recovery of neurological deficit. We report a patient with previously undetected meningioma who required urgent coronary revascularisation on cardiopulmonary bypass leading to reversible neurological complications and discuss management options in the light of currently available literature.

Case Report

A 68 year-old male patient presented to his local hospital with extensive anterior wall myocardial infarction. He continued to experience post-infarction angina and was thus

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referred to the regional cardiac centre where angiography revealed critical coronary artery disease including critical left main coronary stenosis and proximal circumflex artery occlusion. There was no significant stenosis in the right coronary artery. His echocardiography revealed impaired left ventricular function with left ventricular ejection fraction reduced to 25%. In view of critical disease, an intra-aortic balloon pump was inserted and the patient was transported to our centre for further management. He was free of chest pain at admission and was stable with balloon pump support. Apart from a history of hypertension and diabetes, no other past medical history was noted. The clinical examination was unremarkable at admission with no neurological deficit. Laboratory work-up revealed a normal renal and hepatic profile, normal complete blood count, total serum albumin 36 g/L, total cholesterol 5.01 mmol/L, high density lipoprotein 0.75 mmol/L, low density lipoprotein 3.39 mmol/L, C-reactive protein 36.9 mg/L and erythrocyte sedimentation rate 111 mm/hour. The patient was accepted for urgent coronary artery bypass grafting and was scheduled for the next available operating list.

Coronary artery bypass surgery was uneventful with left internal mammary artery graft to left anterior descending artery and saphenous vein grafts to diagonal and obtuse marginal arteries. Total cardio-pulmonary bypass time was 72 minutes and aortic cross-clamp time was 46 minutes. The patient was extubated on the first day after surgery with full neurological recovery and balloon pump support was removed. A few hours after extubation, however, he became confused and drowsy and the following day developed paralysis of both lower limbs and left upper limb. There was no dysarthria or visual impairment. Full neurological assessment was followed by brain CT scan. It revealed a meningioma in the left frontal region, 4.5 cm x 2.8 cm in size (Figure 1), with peri-tumour oedema causing focal mass effect and slight midline shift to the right (Figure 2). There was no evidence of recent cerebro-vascular accident.

On the advice of neurology and neurosurgical teams, the patient was treated conservatively. Passive exercises and nasogastric feeding were instituted. Right lower limb made full recovery of power within the next two days. As the patient's general condition improved, oral feeding was commenced and rehabilitation therapy was instituted. Over the next few weeks, the patient made progressive recovery of left upper and lower limbs. He was ambulant with minimal assistance and fully oriented seven weeks post-operatively when he was discharged from the hospital.

The patient has been followed up by neurosurgery service of our institution for 27 months on conservative management and has not developed any further neurological problems.

Discussion

Meningiomas account for approximately one-fourth of all primary central nervous system tumours, arising from arachnoid cells surrounding brain and spinal cord [1]. Ninety

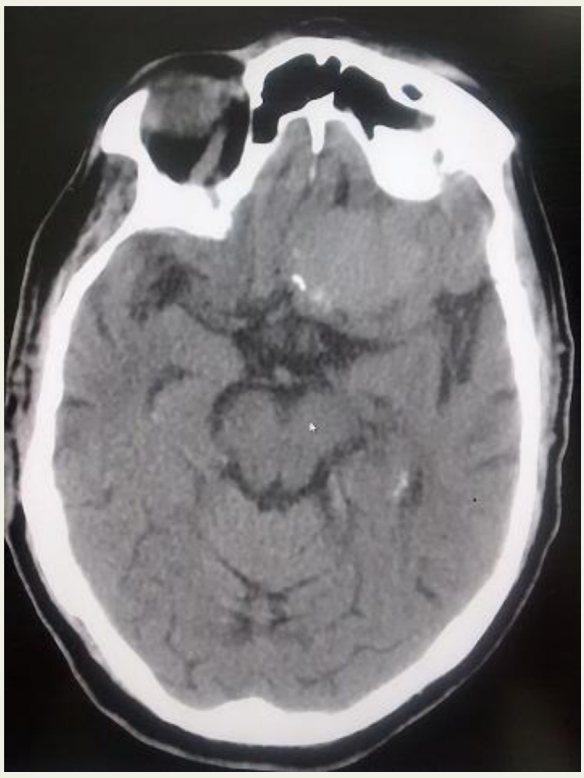

Figure 1 Brain CT scan showing the meningioma in the left frontal region with midline shift.

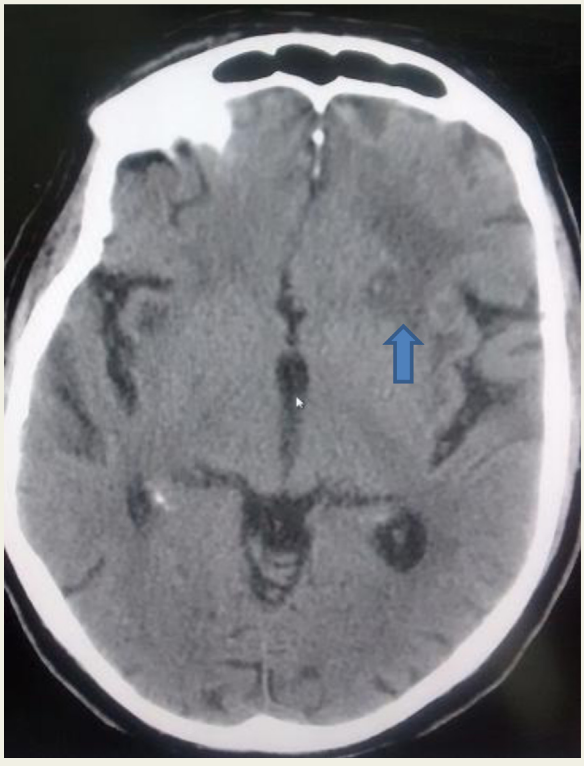

Figure 2 Brain CT scan showing peri-tumour oedema in the left frontal area (arrow).