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## CASE REPORT

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# Severe Arm Pain Preceding Life-threatening Reaction to Gadolinium — a Possible Warning Sign?

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### ABSTRACT

*Gadolinium-based contrast agents are used in selected patients for further characterisation of lesions. These contrast agents are safe for the vast majority of patients, although various adverse reactions to these agents have been reported with relatively few life-threatening reactions, especially with Magnevist (gadopentetate dimeglumine 469 mg/ml). This report is of a patient with a life-threatening reaction to magnevist that was unusual in that the reaction was preceded by intense arm pain.*

*Key Words: Contrast media, Gadolinium, Magnetic resonance imaging*

### CASE REPORT

A 47-year-old man was referred for outpatient magnetic resonance imaging (MRI) for investigation of poorly controlled epilepsy. His antiepileptic therapy consisted of sodium valproate 200 mg and lamotrigine 50 mg. He had no history of asthma or allergy and he had previously undergone intravenous urography using a low osmolar iodinated contrast medium without an adverse reaction. A 1 cm lesion was noted in the pineal region on the MRI and Magnevist (gadopentetate dimeglumine 469 mg/ml [10 ml equivalent to 5 mmol]) was given via a 22 G intravenous cannula inserted into the antecubital vein in the right arm. Immediately following the injection the patient complained of intense and persistent pain in his right shoulder and upper arm.

He developed an erythematous skin rash over the right arm, which rapidly spread over his chest. His vital signs were stable. He was given chlorpheniramine maleate 10 mg and hydrocortisone 100 mg intravenously and was immediately moved to the nearby recovery room for observation. During the next 2 to 3 minutes, he became progressively more restless and complained of a sensation of throat swelling and dyspnoea. Oxygen

was administered by mask and the hospital cardiac arrest team was summoned. He rapidly became diaphoretic and pale with increasing hoarseness and breathlessness. Radial pulses became impalpable. An intravenous infusion of saline was commenced and adrenaline was administered intravenously (1 in 10,000 concentration) with prompt clinical response. At the time of arrival of the cardiac arrest team, the patient was in sinus tachycardia, with a blood pressure measurement of 90/60 mm Hg. Chest auscultation revealed bronchospasm.

He was transferred to the nearby emergency department and was given nebulised salbutamol, intravenous fluids, and oxygen by mask. He continued to complain of intense right shoulder and arm pain for several hours following the injection of gadolinium. There was no evidence of extravasation of the contrast medium nor of thrombophlebitis. Electrocardiograph and cardiac enzyme measurements were normal. His clinical condition stabilised during the next 24 hours and he was discharged from hospital the following day.

### DISCUSSION

Since MRI was introduced to University College Hospital, 137 patients have received intravenous gadolinium (87 magnevist and 50 prohance). This is the first case of a life-threatening reaction.

Gadolinium chelates are generally considered to be safe, although adverse reactions of all types (mild, moderate,

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and severe) have been reported to occur in 0.17% to 3.40% of patients.<sup>1-3</sup> Life-threatening reactions are reported to occur in 0.0003% to 0.0100% of patients. Patients with a history of asthma, allergy, or prior reaction to iodinated contrast medium or gadolinium are at increased risk.<sup>1,2</sup>

The intense and persistent arm and shoulder pain experienced by this patient is striking. In their review of 36 adverse reactions to gadolinium contrast media, Murphy et al noted that 11 patients reported marked skin discomfort in the extremity through which gadolinium was administered.<sup>1</sup> This symptom did not occur in the other 20,967 patients in the study who did not subsequently develop an adverse reaction. These investigators felt that this complaint was more severe than the transient arm discomfort occasionally experienced by patients receiving iodinated contrast media.<sup>1</sup> The cause of this symptom has not been explained.

This report adds another example of severe arm pain preceding an adverse reaction. It may be a useful clinical sign for MRI radiologists and technicians to be

aware of because of its association with adverse reactions in 12 patients to date. Two of the 12 patients had a severe and life-threatening adverse reaction and 4 had a moderately severe reaction.<sup>1</sup>

Although the gadolinium chelates are safe and well-tolerated contrast media, adverse reactions do occur and may be severe.<sup>1-5</sup> Facilities for prompt resuscitation should be available. If a patient complains of unexplained or severe limb pain during or immediately following gadolinium injection, close observation for adverse reaction is recommended.

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