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Case Report

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Swirl sign on computerized tomography for hyperacute phase of spontaneous subdural hematoma: Case a report

Mehmet Secer[a*], Murat Ulutal[b], Erdal Yayla[c], Kadir Cinar[c]

[a] *Department of Neurosurgery, Deva Hospital, Gaziantep, Turkey*
[b] *Department of Neurosurgery, Konukoglu Hospital, Sanko University, Gaziantep, Turkey*
[c] *Department of Neurosurgery, Şehitkamil State Hospital, Gaziantep, Turkey*

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*** Correspondence to:**
Mehmet Secer
Department of Neurosurgery,
Deva Hospital,
Gaziantep, Turkey
e-mail: memetsecer@yahoo.com

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ABSTRACT

Spontaneous hyperacute subdural hematoma is a rare entity. The sequential change in density of subdural hematomas (SDHs) on computerized tomography (CT) is crucial to understand the pathogenesis and evolution of SDHs. Definitive diagnosis of spontaneous or non-traumatic intracranial hematoma of arterial etiology may also be shown on digital cerebral angiography however CT scan is usually more efficient and practical not to delay the operative intervention. The appearance of extraaxial hematoma is typical and hypodense signals within the hyperdense hematoma content may signify active arterial bleeding. Here, we report a 72-year-old man who presented with sudden loss of consciousness and hyperacute subdural hematoma included in swirl sign on his cranial CT scan.

1. Introduction

Spontaneous subdural hematoma with an arterial origin is very rare (Gelabert-González et al., 2004). Computerized tomography (CT) appearance is typical for an acute supratentorial extraaxial intracranial hematoma. Acute extraaxial collection usually consists of formed clot that has become hyperdense (Bergström et al., 1977). The sequential change in density of subdural hematomas (SDHs) on CT is crucial to understand the pathogenesis and evolution of SDHs (Lee et al., 1997). The swirl sign was first defined by Zimmerman and Bilaniuk (1982) and it represents active bleeding for hyperacute epidural hematomas. Here we report a 72-year-old man who presented with acute spontaneous subdural hematoma and associated with swirl sign on preoperative CT scan.

2. Case report

A 72-year-old male patient was admitted to the emergency service due to sudden loss of consciousness. History was unremarkable except for coronary artery disease and hypertension. On admission general condition was poor with a Glasgow Coma Scale (GCS) of four points. An acute subdural hematoma with a marked midline shift was detected on emergent cranial CT scan determined and the patient was

immediately operated for evacuation of hematoma. Etiology of bleeding was a little cortical artery which was coagulated during the operation.

3. Discussion

Subdural hematomas may be acute, subacute or chronic and bleeding is usually due to venous origin secondary to torn bridging veins or venous sinuses (McKissock et al., 1960). Reasons for bleeding in spontaneous or non-traumatic acute subdural hematomas are aneurysms, arteriovenous malformations, metastatic tumors infiltrating subdural space associated with disseminated intravascular coagulation and intracerebral hemorrage opening into the subdural space (McDermott et al., 1984). Similarly in the present case, primary symptoms are usually sudden loss of consciousness or headache. Association of subdural hemotoma originating from arterial structures without a previous predisposing factor is extremely rare. In the series of 100 subdural haemotomas reported by Scott, (1949) there were only 2 spontaneous subdural hemotoma and in one of these patients, he described bleeding cortical artery (McDermott et al., 1984; Gelabert-González et al., 2004).

Findings of active bleeding on CT usually show variability during clot formation and even during surgical decompression within acute extraaxial hemotoma group. Greenberg et al. (1985) described this status as hyperacute subgroup. Zimmerman and Bilaniuk, (1982) reported hyperdense and isodense signals as swirl sign in hyperacute epidural hemotomas.

Classifications of the age of hematomas were made using CT images of extraaxial hemotomas. Scotti et al reported that the density of subdural hematomas on CT was hyperdense in 100% of acute (within 7 days) patients, isodense in %70 of subacute (8-22 days) group and hypodense in %76 of the chronic (over 22 days) group (Scotti et al., 1977).

The case we report here had a delay of 2 hours to reach emergency service after the onset of symptoms and we detected acute subdural hematoma on CT with a swirl sign (Fig. 1). Spontaneous hyperacute subdural hematomas of arterial origin are rare and usually determined at the operation although CT findings may be typical as presented here. Definitive diagnosis of spontaneous or non-traumatic intracranial hematoma of arterial etiology may also be shown on digital cerebral angiography however CT scan is usually more efficient and practical not to delay the operative intervention. However small arterial bleeding can not be shown on CT and this may be a disadvantage for diagnosis (Rengachary and Szymanski, 1981). It is crucial to recognize swirl sign on CT scan and these cases are probable candidates for a more urgent surgical evacuation.

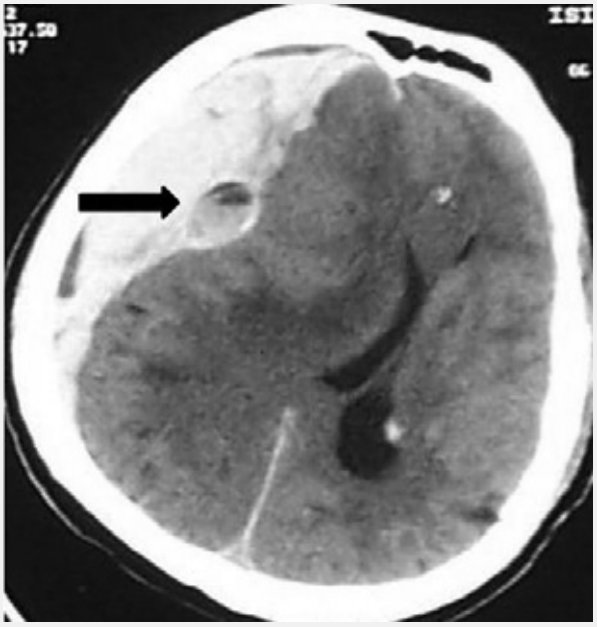

Fig. 1. Hyperacute subdural hematoma and swirl sign (black arrow)

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