

CASE REPORT

OLGU SUNUMU

BEACON SIGNAL IN TRANSCRANIAL COLOR CODED ULTRASOUND: A SIGN FOR BRAIN DEATH

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ABSTRACT

A widely under-recognized brain-death confirming transcranial ultrasonography pattern resembling the red-blue beacon signal was demonstrated. Familiarity to this distinct and characteristic ultrasonic pattern seems to be important in the perspective of point-of-care neurological ultrasound use and knobology.

Key Words: Brain death, Doppler, beacon, color-coded.

**TRANSKRANIAL RENKLİ DOPPLER ULTRASONOGRAFİDE "POLİS ÇAKAR LAMBASI (FLAŞÖR) İŞARETİ":
BEYİN ÖLÜMÜ DOĞRULAMASI İÇİN AZ TANINAN BİR BULGU**

ÖZET

Bu olgu aracılığıyla beyin ölümü tanısını doğrulayan ancak yeterince iyi bilinmeyen bir transkraniyal renkli Doppler ultrasonografi bulgusu olan flaşör işaretini tanıtıyoruz. Bu ve benzeri paternlerin bilinmesi yatak başı veya nörolojiye özel amaçlara yönelik ultrason kullanımının knobolojik doğasının bir gereğidir.

Anahtar Sözcükler: Beyin ölümü, Doppler, flaşör, çakar lambası, renk-kodlama.

INTRODUCTION

Transcranial Doppler ultrasonography is a valuable tool for demonstrating cerebral circulatory arrest in the setting of brain death. Complete reversal of diastolic flow (to-and-fro flow signal) and systolic spikes in bilateral terminal internal carotid arteries and vertebrobasilar circulation are well-known sonogram patterns supporting the diagnosis of cerebral circulatory arrest (1,2). However, brain-death confirmatory patterns of transcranial color-coded ultrasound (TCCU) imaging have not so widely been known. We herein present an example of the beacon signal which is quite specific and well-described, but again mostly underrecognized, TCCU appearance in cases with brain death.

CASE AND SIGN PRESENTATION

In a patient with massive subarachnoid hemorrhage from a partially treated cerebral arteriovenous malformation, brain death was clinically diagnosed shortly after his arrival to the emergency department. Transcranial triplex ultrasound demonstrated a distinctive and striking appearance of alternating flashes of blue and red signals on color-coded mode (figure). Pulsed Doppler mode showed to-and-fro flow pattern in both intracranial internal carotid and vertebral arteries, classically consistent with cerebral circulatory arrest.

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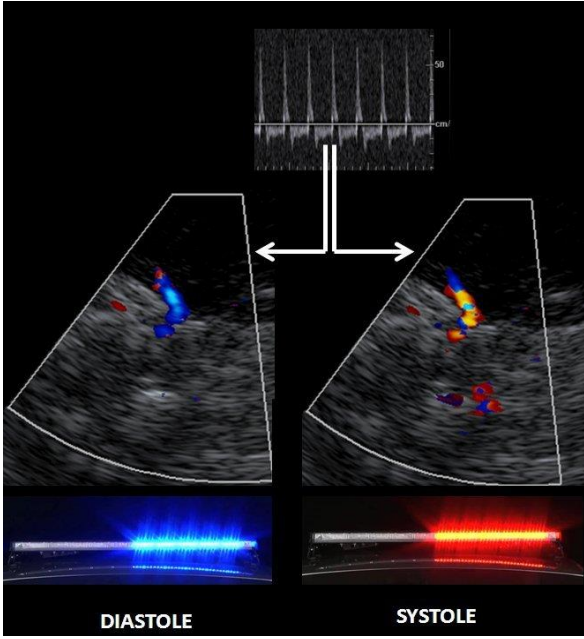


Figure: Pulsed Doppler imaging shows oscillating to-and-fro appearance with net zero forward flow (mid upper). Color coded imaging obtained during diastole and systole and corresponding light-bar beacon pictures were given on the right and left side, respectively.

DISCUSSION

The alternative red and blue flashes are caused by pulse Doppler effect from back-and-

forth movements of the locked cerebrovascular blood column by heart-beat related proximal percussions (3). In the picture, backward movement during diastole (negative Doppler effect) is coded as blue, while forward movement during systole (positive Doppler effect) as red. This appearance looks like, and brings to the minds, the rooftop light-bar beacons of police cars. This is a previously described (4) but widely under-recognized and under-cited brain-death confirming transcranial ultrasound pattern. Indeed, it is so marked that it will never be forgotten if it is once seen.

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