Both spindles and barques are normal entities of the hippocampal intracranial electroencephalogram. The presence of barques may also signify lack of epileptogenic properties in the hippocampus [1].

Kokkinos et al. identified 51 focal epilepsy patients implanted with a minimum of two electrodes - unilateral anterior and posterior - in either hippocampus. We used visual inspection of the intracranial electroencephalogram (iEEG) and 3D brain volume spectrum-based statistical parametric mapping (SPM) to localize barques.

In 18/51 patients (35.29%), barques were identified in 22/70 (31.42%) hippocampi. In all hippocampi (100%), barques were present in the posterior hippocampus, while 9 (40.90%) showed concurrent non-independent barque activity anteriorly ($P < 0.0001$). Statistical parametric mapping confirmed the posterior barque localization, with significant differences in t-values ($t(27) = 8.08$, $P < 0.0001$) and z-scores ($t(24) = 6.85$, $P < 0.0001$) between anterior and posterior hippocampal barque activity. Posterior lateral extrahippocampal contacts demonstrated phase reversals of positive polarity during barque activity ($P = 0.0092$, compared to anterior extrahippocampal contacts).

Conclusions: This study highlights the posterior hippocampal predominance of barques. Our findings are concordant with the posterior distribution of the scalp manifestation of barques as “14&6/sec positive spikes”. The posterio-lateral hippocampal barque phase reversal can explain the positive polarity of scalp 14&6/sec spikes.

Significance: Understanding the properties of barques is critical for the iEEG interpretation in epilepsy surgery evaluations that include the hippocampus [2].

1)
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2)
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