

Late Gadolinium Enhancement on Cardiac MRI in Patients With Takotsubo Syndrome:
Insights From the Multicenter EVOLUTION Registry

心碎症候群患者心臟 MRI 中的延遲性釷增強表現：來自多中心EVOLUTION登錄研究的觀察
結果

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作者提供的完整首頁資訊, 請參見本文末尾。

Abstract

摘要

Background:

Late gadolinium enhancement (LGE) has traditionally been considered absent in Takotsubo syndrome (TS). However, accumulating evidence indicates the finding's presence during the acute phase in a subset of patients.

背景:

傳統上，延遲性釐增強 (late gadolinium enhancement, LGE) 被認為在心碎症候群 (Takotsubo syndrome, TS) 中並不存在。然而，愈來愈多的證據顯示，在部分病人急性期仍可觀察到此一影像表現。

Objective:

To evaluate the frequency of LGE, identify factors associated with LGE presence, assess prognostic implications of LGE, and compare methods for quantifying LGE extent, in patients with TS undergoing cardiac MRI.

研究目的:

評估接受心臟MRI檢查之TS病人中LGE的發生頻率，找出與LGE出現的相關因素，評估LGE的預後意義，並比較不同方法在量化LGE範圍上的差異。

Methods:

This retrospective study included 370 patients (338 female; 42 male; mean age 69.7 ± 12 years) from the nine-center EVOLUTION registry from November 21, 2007 to December 22, 2024. The registry included patients with hospital admission for TS who underwent cardiac MRI within 10 days after symptom onset; patients were required to fulfill professional society criteria for TS diagnosis. Two radiologists independently reviewed LGE images to assess examinations for the visual presence of LGE, resolving discrepancies for further analyses. In patients with LGE, a radiologist quantified LGE extent visually and using semiautomated methods (2-SD, 3-SD, and 5-SD threshold methods relative to remote myocardial signal intensity; full-width at half-maximum method relative to LGE peak signal intensity). In-hospital adverse events (death or major cardiac or cerebrovascular events) were identified.

研究方法:

本回溯性研究納入EVOLUTION多中心登錄資料庫中370名病人(女性338人;男性42人;平均年齡 69.7 ± 12 歲)，收案期間為2007年11月21日至2024年12月22日。登錄對象為因TS住院，且於症狀出現後10天內接受心臟MRI檢查的病人;所有病人皆需符合專業學會對TS的診斷標準。兩位放射科醫師獨立判讀LGE影像，以視覺方式評估是否存在LGE，若有歧見則經討論達成共識後納入後續分析。在出現LGE的病人中，由其中一位放射科醫師以視覺評估及半自動化方法量化LGE範圍(包括相對於遠端正常心肌訊號強度的2-標準差、3-標準差與5-標準差閾值法，以及相對於LGE峰值訊號強度的半高全寬[full-width at half-maximum]法)。同時記錄住院期間不良事件(死亡或重大心臟或腦血管事件)。

Results:

The two radiologists identified LGE in 58 (15.7%) and 54 (14.5%) patients; by consensus, LGE was present in 58 (15.7%) patients. In multivariable analysis, LGE presence was independently associated with a shorter interval from presentation to cardiac MRI (OR per day=0.81, $p=0.003$) and a greater extent of myocardial edema on T2-weighted STIR images (OR per segment=1.44, $p<0.001$). The mean LGE extent by visual assessment was 25.5%. Among semiautomated methods, correlation with visual assessment of LGE extent was greatest for the 2-SD threshold method ($p=0.93$). In-hospital adverse events occurred in 88 (23.8%) patients and were not significantly associated with LGE presence ($p=.44$) or extent by any method (all $p>0.05$).

研究結果:

兩位放射科醫師分別在58人(15.7%)及54人(14.5%)中辨識出LGE;經共識判讀後,共有58人(15.7%)確認存在LGE。多變項分析顯示,LGE的存在與自就醫至接受心臟MRI的時間間隔較短(每1秒 OR=0.81, $p=.003$),以及T2加權STIR影像上心肌水腫範圍較大(每增加一節段 OR=1.44, $p<.001$)具有獨立相關性。以視覺評估所得之LGE平均範圍為25.5%。在各種半自動化方法中,以2-標準差閾值法與視覺評估之LGE範圍相關性最高($p=0.93$)。住院期間不良事件發生於88人(23.8%),其發生與LGE的存在($p=.44$)或任何方法量化之LGE範圍皆無顯著相關(所有 $p>.05$)。

Conclusion:

LGE was identified in 15.7% of patients with TS and showed significant independent associations with greater myocardial edema extent and earlier MRI timing after presentation but was not associated with in-hospital adverse events.

研究結論:

在TS病人中,有15.7%可辨識出LGE;LGE的出現與較大的心肌水腫範圍及較早進行MRI檢查具有顯著且獨立的相關性,但與住院期間不良事件的發生並無相關。

Clinical Impact:

The results may provide useful context when radiologists encounter LGE on cardiac MRI in patients with TS.

臨床影響:

當放射科醫師在TS病人的心臟MRI中觀察到LGE時,本研究結果可提供有助於臨床判讀與理解的背景資訊。