

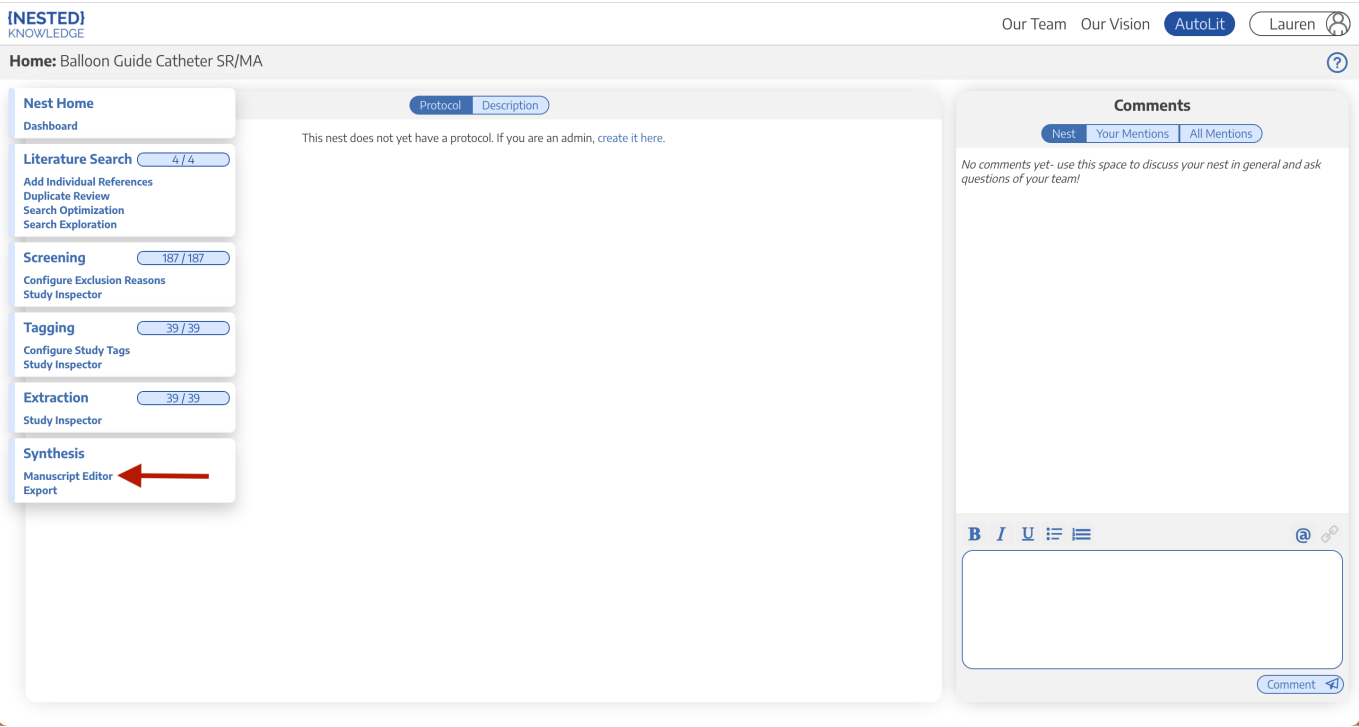
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ABSTRACT

Background: Balloon guide catheters (BGC) are designed to induce flow arrest during mechanical thrombectomy (MT) procedures for acute ischemic stroke due to large vessel occlusion, and have been associated with improved clinical and angiographic outcomes. We reported the results of a systematic review and meta-analysis evaluating the relative technical and clinical outcomes associated with BGC vs. non-BGC approaches.

Methods: A systematic review of clinical literature using the PubMed database was undertaken to identify studies published between 2010 and 2021 reporting the use of BGC versus non-BGC approaches for stroke treatment. Data collected included complete recanalization (Thrombolysis in Cerebral Infarction, TICI), first pass effect (FPE) TICI 3, puncture-to recanalization time, number of endovascular attempts, distal embolization, symptomatic intracerebral hemorrhage (sICH), 90-day modified Rankin Scale (mRS) 0-2, and 90-day mortality. Subgroup analyses assessed the impact of treatment device (stent-retrievers, contact aspiration, combination therapy, and not-specified/other). A random effects model was fit for each outcome measure.

Results: Fifteen studies were included. Compared to non-BGC approaches, patients treated with BGCs had higher odds of TICI 3 (OR=1.57 [95% CI: 1.08; 2.29]) and FPE TICI 3 (OR=3.63 [95% CI: 2.34; 5.62]), reduced puncture-to-revascularization time (MD=-7.8 [95% CI: -13.3; -2.2]), fewer endovascular attempts (MD=-0.47 [95% CI: -0.68; -0.26]), reduced odds of sICH (OR=0.66 [95% CI: 0.51; 0.86]) and distal emboli (OR=0.34 [95% CI: 0.17; 0.71]), higher odds of 90-day mRS 0-2 (OR=1.51 [95% CI: 1.27; 1.79]), and reduced odds of mortality (OR=0.69 [95% CI: 0.57; 0.82]).

Conclusions: BGCs yield superior technical and clinical outcomes while reducing patient complications.

Introduction

Balloon guide catheters (BGC) provide flow arrest during mechanical thrombectomy (MT) procedures for acute ischemic stroke (AIS) due to large vessel occlusion (LVO).¹⁻³ BGCs may be used as part of the first-line treatment strategy, either in combination with an aspiration catheter or stent retriever alone, or as part of combination procedures involving multiple techniques.⁴ BGCs are hypothesized to promote better recanalization and clinical outcomes, but their comparative efficacy vs. non-BGC approaches remains controversial.^{5,6}

Prior meta-analyses of non-randomized studies have demonstrated superior clinical and angiographic outcomes associated with the use of BGCs.^{7,8} In this study, we performed a systematic review and meta-analysis of multi-arm clinical studies reporting outcomes of patients treated with MT using BGCs vs. non-BGC procedures to evaluate their relative technical and clinical performance.

Methods

Literature search and study selection

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3. Insert Updatable Tables

To insert an updatable table, select the table icon with the plus sign. When the included studies and

collected data change, the tables will update accordingly.

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Example:

Insert Updatable Table

Updatable tables allow you to define tables populated with living data from this Nest, meaning the table will update when records are updated, added, or deleted. Specify the type of data, columns, and filters for your table:

Table of:

Study
Study Arm
Intervention
Tagged BGC plus Stent-trieter X

Columns:

Add

Column Title X Column First Author X Column Year X

Close

Insert

Insert Updatable Table

Updatable tables allow you to define tables populated with living data from this Nest, meaning the table will update when records are updated, added, or deleted. Specify the type of data, columns, and filters for your table:

Table of:

Intervention

Filter to:

Add

Intervention

BGC

Columns:

Add

Column

Intervention

Column

Intervention

Column

FPE TICI 2b-3 (n/N)

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