

# INPLASY PROTOCOL

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**Conflicts of interest:**  
None declared.

## Clinical features and management of different complications associated with choroidal osteoma: a systematic review protocol

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**Review question / Objective:** This systematic review aims to explore the clinical features of choroidal osteoma and make therapeutic effect evaluations of various therapies for complications associated with choroidal osteoma.

**Condition being studied:** Choroidal osteoma (CO) is a benign ossifying tumor within the choroid with multiple short branching tufts of vessels on the tumor surface. This rare condition was first described by Gass et al. in 1978. Choroidal osteoma has a sex predilection to occur predominantly in young healthy females, and the exact etiology of CO remains unknown. Complications associated with CO, including disruption of retinal pigment epithelium (RPE), atrophy of photoreceptor (PR), subretinal fluid (SRF), and choroidal neovascularization (CNV), are tough challenges for clinicians. Therapies targeting at secondary CNV, SRF, and tumor enlargement or extension under the fovea include surgical removal, laser photocoagulation, transpupillary thermotherapy (TTT), photodynamic therapy (PDT), and anti-vascular endothelial growth factor (anti-VEGF) intravitreal injections, but options of better management remain controversial. A comprehensive integration of current evidence is thus of urgent need.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 August 2022 and was last updated on 30 August 2022 (registration number INPLASY202280108).

### INTRODUCTION

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## METHODS

**Search strategy:** This systematic review will be conducted in compliance with the ‘Preferred Reporting Items for Systematic Reviews and Meta-analyses (the “PRISMA” statement). The electronic databases including PubMed, EMBASE and Ovid will be searched. The following search strategy: ("choroid"[MeSH Terms] OR "choroid"[All Fields] OR "choroids"[All Fields] OR "choroidal"[All Fields] OR "choroidally"[All Fields] OR "choroidals"[All Fields] OR "choroideal"[All Fields] OR "choroiditis"[MeSH Terms] OR "choroiditis"[All Fields] OR "choroiditides"[All Fields]) AND ("osteoma"[MeSH Terms] OR "osteoma"[All Fields] OR "osteomas"[All Fields]) will be used in Pubmed, and this search strategy will also be applied to the other electronic databases. Only human studies published in English will be included. In addition, the reference lists from previous reviews and selected publications will also be screened to identify any additional relevance.

**Participant or population:** Patients with secondary complications associated with choroidal osteoma, including CNV, SRF,

tumor enlargement or extension under the fovea.

**Intervention:** Anti-vascular endothelial growth factor (anti-VEGF) intravitreal injections.

**Comparator:** Surgical removal, laser photocoagulation, transpupillary thermotherapy (TTT), photodynamic therapy (PDT).

**Study designs to be included:** Articles will be considered for inclusion if they are case reports, case series, observational studies, or randomized controlled trials (RCTs). Letters or correspondences addressing relevant cases will also be included. Review articles, retracted articles, conference abstracts, commentaries, and animal studies will be excluded.

**Eligibility criteria:** Studies that 1) report precise diagnosis of CO basing on pathological examinations or fundus examinations and B-scan ultrasonography or computerized tomography (CT-scan), 2) report CO patients presenting with necessity for treatment due to vision-threatening complications, including secondary CNV, SRF, or tumor enlargement or extension under the fovea, 3) report clearly defined treatment protocol for each patient, including method of therapy, parameter settings, treatment procedure, and sessions of treatment, 4) report patients with ocular outcome data, including visual acuity, fundus examinations, FFA, ICGA, OCT, or OCTA, will be considered to satisfy the inclusion criteria. Studies that report anecdotal data on ocular symptoms, instead of the aforementioned ocular examinations, will be excluded to reduce bias.

**Information sources:** The electronic databases including PubMed, EMBASE and Ovid will be searched, and the reference lists from previous reviews and selected publications will also be screened to identify any additional relevance.

**Main outcome(s):** Visual acuity.

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**Additional outcome(s):** Visual symptoms, central retinal thickness, tumor thickness, tumor size, tumor decalcification, SRF resolution, CNV resolution.

**Data management:** All searched studies will be imported into EndNote software, which can assist the reviewers in managing data and screening for duplicate publications. The data obtained will be subsequently entered in MS Excel and analyzed on IBM's statistical package for the social sciences (SPSS) version 26.

**Quality assessment / Risk of bias analysis:**

Methodological quality will be assessed using the Newcastle–Ottawa Scale (NOS) for case series and case reports adapted by Murad et al. The tool consists of 8 criteria out of 4 domains (selection, ascertainment, causality, and reporting). Items related to adverse drug events will be removed and result in 5 criteria to be assessed. We will consider the study as “good quality” when all five criteria are satisfied, “moderate quality” when four are satisfied, and “poor quality” when three or fewer are satisfied.

**Strategy of data synthesis:** Descriptive analyses will be used to present the patient characteristics. Statistical analysis will be performed using SPSS v.26.0. Categorical variables will be presented as numbers and percentages. Continuous variables will be presented as the median and interquartile range (IQR). Normality of data distribution will be assessed by the Shapiro–Wilk test. Categorical variables between the groups will be compared with the chi-squared test or Fisher’s exact test. Continuous variables will be compared with the Wilcoxon rank-sum test. A p-value < 0.05 will be considered statistically significant.

**Subgroup analysis:** Not applicable.

**Sensitivity analysis:** Not applicable.

**Language restriction:** English.

**Country(ies) involved:** China.

**Keywords:** choroidal osteoma, therapy, systematic review protocol.

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