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REVIEW ARTICLES

Juvenile Recurrent Parotitis: a systematic review of diagnosis and treatment

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ABSTRACT

Introduction: Juvenile recurrent parotitis is a benign, non-obstructive inflammatory condition of the parotid gland, characterized by recurrent painful swelling, usually starting in preschool age and often self-limiting.

Objectives: To synthesize and critically appraise the most recent evidence on diagnostic and therapeutic approaches in pediatric juvenile recurrent parotitis.

Methods: A systematic review was conducted in accordance with the PRISMA 2020 guidelines. PubMed, Scopus, and SciELO databases were searched (2020–June 2025). Original studies (cohort, case–control, case series), as well as systematic and narrative reviews on pediatric juvenile recurrent parotitis, were included. Methodological quality was assessed using Joanna Briggs Institute tools specific to each study design.

Results: A total of 17 studies involving 778 children were included, with sample sizes ranging from 6 to 146 participants. Diagnosis was primarily based on clinical criteria and ultrasound. Sialography, magnetic resonance imaging, and computed tomography were reserved for specific situations. Treatment options included conservative management, selective antibiotics, duct irrigation, corticosteroid instillation, and sialendoscopy. Most studies reported a reduction in recurrence and severity following intervention, particularly after sialendoscopy. Surgical resection was reserved to severe, refractory cases.

Conclusions: Juvenile recurrent parotitis is a benign yet disruptive disorder. Ultrasound remains the first-line diagnostic tool, and sialendoscopy is a promising, safe, and effective treatment for recurrent cases. Clinicians should consider escalating from conservative to interventional therapy when patients experience frequent recurrences or significant impairment in quality of life.

Keywords: children; diagnosis; juvenile recurrent parotitis; salivary glands; therapeutic

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INTRODUCTION

Juvenile recurrent parotitis (JRP) is a benign, non-obstructive inflammatory disorder of the parotid glands characterised by recurrent episodes of painful swelling. Although most cases are unilateral, bilateral involvement may also occur. JRP typically presents between the ages of three and six and shows a slight male predominance.[1,2]

Although large-scale epidemiological data are lacking, JRP is considered an uncommon condition, accounting for approximately 0.002–0.05% of pediatric hospital admissions. Despite its rarity, JRP is the second most frequent cause of parotid swelling in children after mumps.[3-5] Its underlying aetiology remains uncertain, with proposed mechanisms including congenital ductal anomalies, infections, and immune system dysregulation.[5-8]

The diagnosis of this condition is primarily clinical, based on the occurrence of at least two episodes of parotid inflammation, and is supported by ultrasonography (US), the preferred first-line imaging method. Sialendoscopy has also emerged as a valuable diagnostic tool, as it allows direct visualisation of the ductal system.[2,9,10-21]

Management of JRP is typically conservative. Minimally invasive interventions such as sialendoscopy or parotid duct irrigation have been increasingly used in children with severe or recurrent disease, whereas surgical treatment is rarely required and is reserved for refractory cases.[10,14,15,17,18]

Although JRP is a benign condition, its recurrent nature and impact on quality of life highlight the need for standardized diagnostic criteria and evidence based management strategies.[1,2,5,7,16,20,22] This systematic review aims to synthesise the latest evidence on diagnostic and therapeutic approaches for JRP.

METHODS

This systematic review was conducted in accordance with PRISMA 2020 guidelines[3] and followed a predefined protocol specifying the eligibility criteria, search strategy, data extraction procedures, and risk of bias assessment. The protocol was not prospectively registered in PROSPERO because data extraction was completed at the time of submission; however, the complete protocol is available from the authors upon reasonable request, to ensure methodological transparency and reproducibility.

Research Question

The review question, structured according to the PICO framework, was: in patients under 18 years with JRP, what diagnostic methods and treatment approaches are currently used, and what evidence supports their effectiveness and safety?

Eligibility Criteria

Studies were included if they involved pediatric patients (under 18 years) diagnosed with JRP, reported diagnostic and/or therapeutic approaches, and were original research articles (cohort, case–control, or case series).

Narrative reviews, systematic reviews, and book chapters were screened only to identify additional primary studies and provide contextual background; these sources were not eligible for inclusion.

Studies were excluded if they did not address the primary outcomes of interest, consisted of single case reports, focused exclusively on adult patients and/or were unrelated to the research question.

Information Sources and Search Strategy

Information was gathered from PubMed, Scopus, and SciELO for studies published in the past five years up to June 1, 2025, with no language restrictions. A comprehensive search strategy was created using combinations of keywords and Medical Subject Headings (MeSH) to ensure sensitivity. The main search terms included: “juvenile recurrent parotitis,” “recurrent parotitis in children,” and “pediatric recurrent parotitis,” combined with diagnostic and therapeutic descriptors such as “ultrasound,” “sialography,” “sialendoscopy,” and “treatment” using Boolean operators (AND, OR). Search strings were adapted for each database, and the reference lists of included articles were also manually reviewed to identify additional eligible studies.

Study selection

Two reviewers independently screened titles, abstracts, and full texts in Rayyan, a web-based platform for systematic review management, according to the predefined eligibility criteria. Disagreements were resolved through discussion until consensus was reached. The study selection process is presented in a PRISMA flowchart (**Figure 1**).

Data collection process

Two reviewers independently extracted data using a standardised, pre-piloted data extraction form, collecting information on year of publication, country, study design, population characteristics, mean age, diagnostic criteria, therapeutic interventions, and main conclusions (**Table 1**). Any discrepancies were resolved through discussion or consultation with a third reviewer.

Study risk of bias assessment

The methodological quality of the included studies was independently assessed by two reviewers using the Joanna Briggs Institute (JBI) Critical Appraisal Tools, with tools selected according to each study design. Discrepancies were resolved by consensus.

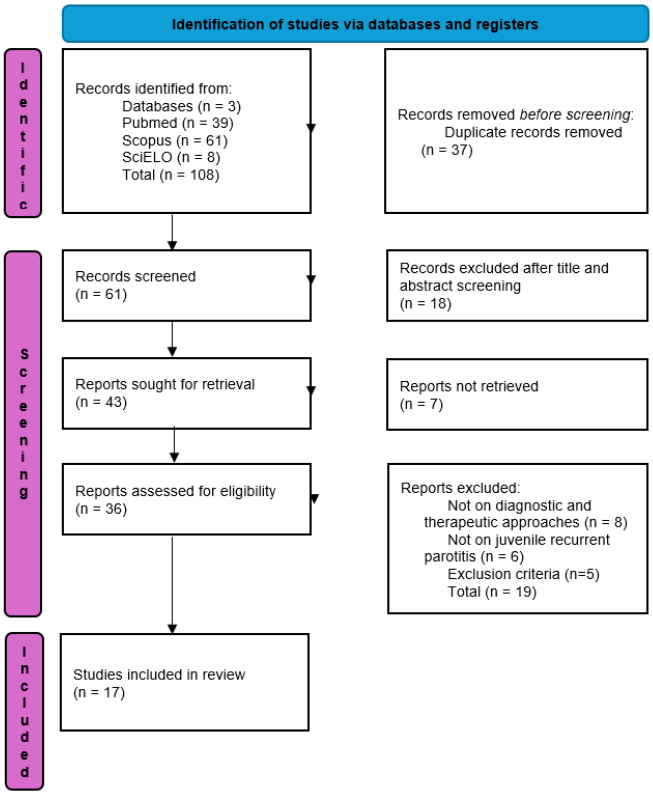

Figure 1 - Flowchart of the search strategy and study selection process

Table 1 - Summary of included studies on juvenile recurrent parotitis (JRP)

Title	Authors/Reference	Year	Country	Study Design	Population	Mean Age	Diagnostic Criteria	Therapeutic Interventions	Main Conclusions	Quality
Common Characteristics & Management of JRP	Benaim EH, Fan T, Dash A, Gillespie MB, McLevy-Bazzanella J **(1)**	2022	USA	Retrospective case series	31	6.9 y	≥2 episodes; US/MRI with sialectasis	Supportive care, sialendoscopy, parotid duct irrigation, intraductal corticosteroids	Supportive care effective; sialendoscopy for severe cases	Case-series: 8/10
Salivary Gland Disorders: 15 Years' Experience	Gellrich D, Bichler M, Reichel CA, Schrötzlmair F, Zengel P **(3)**	2020	Germany	Retrospective case series	146	–	Clinical + US	Sialogogues, massage, antibiotics, sialendoscopy, surgical resection	Accurate diagnosis + severity-based therapy	Case-series: 8,5/10
Key Findings and Experience in the Management of JRP with Sialoendoscopies—A Retrospective Study	Mohana A, Bar O, Porat Ben Amy D, Abdelraziq M, Abu El-Naaj I. **(4)**	2023	Israel	Retrospective study	17	3.6 y	≥2 episodes; US ± sialography	Supportive care, sialendoscopy, surgical resection	Supportive care first-line; sialendoscopy effective	Case-series: 8/10
Recurrent parotitis in children – Case series and literature review	Mendes AR, Moreira L, Dias Â, Lopes A, Lobo AL, Simão TS **(5)**	2021	Portugal	Retrospective case series + narrative review	24	7.4 y	≥2 episodes parotid swelling; clinical + US	Non-steroidal anti-inflammatory drugs, supportive care, imaging, immunologic workup	Benign course; selective imaging/ laboratory tests advised	Case-series: 9/10
Salivary Gland Disorders: 20 Years' Experience	Lo Giudice G, Marra PM, Colella C, Itro A, Tartaro G, Colella G **(6)**	2022	Italy	Retrospective case series	99	10 y	≥2 episodes; US confirmation	Supportive care, antibiotics, sialendoscopy	PRJ most common; US critical	Case-series: 8/10
Interventional treatment for JRP: 10-year experience	Boogaard S, Saniasiaya J, McCaffer C, Toll E, Van der Meer G **(7)**	2025	New Zealand	Retrospective case series	31	6.8 y	≥2 episodes/ year + sialectasis	Sialography, duct dilation, sialendoscopy, intraductal corticosteroids	Sialendoscopy most effective; lipiodol sialography ↑ reintervention	Case-series: 8,5/10
Immune disorders associated with JRP	Hidalgo-Santos AD, Gastón-Téllez R, Ferrer-Lorente B, Pina-Pérez R, Oltra-Benavent M **(8)**	2020	Spain	Retrospective case series	36	6.3 y	≥2 episodes; US with sialectasis	Supportive care, immunologic management	44% had immune abnormalities	Case-series: 8/10

Current ultrasonography potential in the diagnosis of JRP	Vozgoment OV, Kostenko EA, Nadtochiy AG, Fisenko EP, Zaitseva NV. **(9)**	2023	Russia	Cross-sectional comparative study	72 (42 JRP, 30 controls)	3–17 y	US features: gland size, echogenicity, vascularity	US	US shows specific signs supporting diagnosis	Analytical Cross-Sectional Studies: 8/8
Sialendoscopy in Management of JRP – Single Centre	Pušnik L, Jerman A, Urbančič J, Aničin A (10)	2022	Slovenia	Retrospective case series	24	7.9 y	≥2 episodes; US with sialectasis	Sialendoscopy, parotid duct irrigation, intraductal corticosteroids	Safe, effective; reduced recurrence	Case-series: 4/10
Treatment of JRP with irrigation therapy without anesthesia	Geisthoff UW, Droege F, Schulze C, Birk R, Rudhart S, Maune S, et al. **(11)**	2022	Germany	Retrospective case series	6	–	≥3 episodes/ year; US hypoechoic areas	Parotid duct irrigation	Safe; improved symptoms; avoids anesthesia	Case-series: 7/10
Pediatric sialendoscopy: 11-year single-centre	Kanerva M, Tapiovaara L, Aro K, Saarinen R. **(14)**	2020	Finland	Retrospective case series	42	11 y	≤16 y; sialendoscopy for JRP/ sialolithiasis	Sialendoscopy	>90% symptom-free after 1 procedure	Case-series: 9/10
Parotid irrigation: A promising option for JRP	Grande-Moreillo C, Margarit-Mallol J, Fuentes-Carretero S, Torolla A, Martí-Camps M, Rodríguez-Molinero A. **(15)**	2022	Spain	Retrospective cohort	15	8.7 y	≥3 episodes/ year; US with sialectasis	Parotid duct irrigation	Safe; 44% asymptomatic; reduced episodes	Cohort Studies: 4,5/11
Early Life Exposures & Salivary Gland Disease Risk	Resende de Paiva C, Sørensen KK, Schrøder SA, Foghsgaard J, Torp-Pedersen C, Howitz MF **(16)**	2022	Denmark	Case-control	>2M	–	ICD-coded diagnoses	–	Prematurity, low birth weight, early infections ↑ risk	Case-Control: 10/10
Juvenile idiopathic recurrent parotitis (JIRP) treated with short course steroids, a case series study and one decade follow up for potential autoimmune disorder	Salehzadeh F, Molatefi R, Mardi A, Nahanmoghaddam N **(17)**	2024	Iran	Retrospective case series	10	5 y	≥2 episodes; clinical + US	Short-course systemic corticosteroids	Effective, well tolerated	Case-series: 9/10
Superficial Parotidectomy for JRP	Wilson J, Gorelik M, Gulliver J, Jaju A, Bhushan B, Rastatter J, et al **(18)**	2023	USA	Retrospective case series	20	–	Recurrent swelling; MRI/ US	Surgical resection (superficial parotidectomy)	Effective; mild Frey syndrome common	Case-series: 6/10
Unilateral Sialendoscopy for JRP: What Happens to the Other Side?	Konstantinidis I, Dogantzis P, Angelos C, et al. **(19)**	2020	Greece	Prospective cohort	77	9.6 y	Recurrent swelling; US grading	Sialendoscopy, intraductal corticosteroids	Contralateral rarely needed	Cohort Studies: 8/11
JRP: Soft foods & salivary development	Wu S, Wang B, Yu C, Wang Z, Xie L, Fu J, et al. **(22)**	2020	China	Comparative observational study	128 JRP, 120 controls	2–13 y	≥2–3 episodes; ≥4 days	–	Soft diet may impair gland development	Analytical Cross-Sectional Studies: 6/8

Legend: Summary of included studies on juvenile recurrent parotitis (JRP), detailing study design, sample characteristics, diagnostic criteria, interventions, main outcomes, and methodological quality according to the Joanna Briggs Institute (JBI) Critical Appraisal Tools. The 17included studies comprised 12 retrospective case series, 2 cohort studies, 1 case–control study, 2 cross-sectional comparative studies, 4 narrative reviews, and 1 scoping review.

RESULTS

Study Characteristics

A total of 17 studies were included, consisting of 12 retrospective case series, two cohort studies, one case–control study, and two comparative observational studies (**Figure 2**).[1,3-11,14-19,22]

Across the primary studies, a total of approximately 778 children were included, with sample sizes ranging from 6 to 146 participants.[1,3–8,10,11,14,17,18] Reported mean ages of the participants ranged from 3.6 to 11 years, indicating a predominance of school-aged children.[1,4–8,10,11,14,17,18] When sex distribution was reported, most cohorts showed a male predominance.[1,4–8,10,11,14,17,18]

Interventional studies mainly assessed ductal techniques, including sialendoscopy, parotid duct irrigation, sialography, and intraductal corticosteroid delivery, while supportive care and non-steroidal anti-inflammatory drugs were often described as first-line management.[1,4–8,10,11,14,15,17,18] Surgical interventions, particularly superficial parotidectomy, were reserved for refractory cases.[18]

Publication rates remained fairly stable over the past five years (**Figure 3**), with the United States leading in the number of publications, followed by Italy, Spain, Germany, and other European nations (**Figure 4**).[1,6,10,11,15,16]

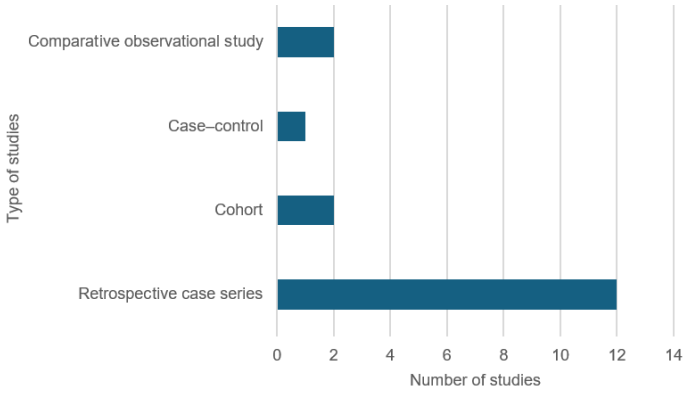

Figure 2 – Distribution of study designs among included publications.
Legend: Proportion of studies categorised as retrospective case series, prospective cohorts, case–control studies, interventional trials, and narrative/scoping reviews in the final synthesis (n = 17). Values shown as absolute counts.

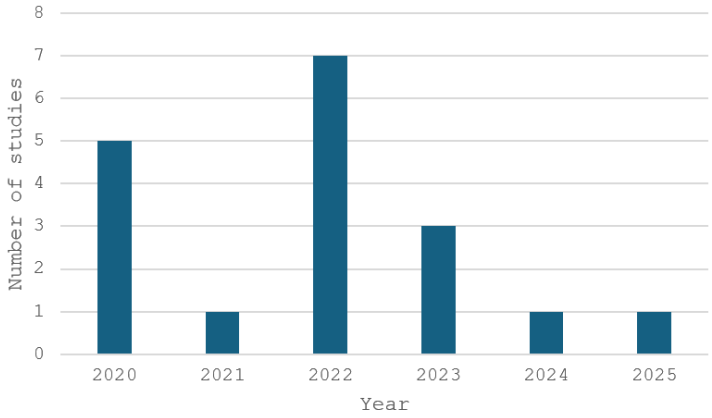

Figure 3 – Annual publication trends of studies on juvenile recurrent parotitis.
Legend: Number of publications per year from 2020 to 2025.

Figure 4 – Geographic distribution of included studies.
Legend: Countries of origin of the included studies (n = 17).

Epidemiological features

The median number of annual episodes ranges from 4.7 to 6, although some children experience more than 10 recurrences per year.[1,6,10,15] In a retrospective case series of 31 pediatric patients, 74% presented with bilateral swelling and 58% were male; the median number of episodes was six per year, each lasting approximately seven days. More than a quarter required hospitalization during acute phases, and 87% had a history of antibiotic exposure.[1] Perinatal and neonatal factors—including prematurity, low birth weight (<2500 g), neonatal infections, early antibiotic exposure, male sex, and maternal age under 25 years—were identified as potential risk factors for developing JRP.[16] Overall, the available epidemiological and clinical evidence indicates a benign, self-limited course, with spontaneous resolution by puberty in most cases.[1,17,19]

Clinical manifestations

Recurrent parotid gland enlargement was the most frequently reported feature, described in 16 of 17 studies and present in nearly all affected children.[1,3–11,14–15, 17–19,22]

Local pain was reported in 14 of 17 studies, while fever appeared in 12 of 17 studies.[1,3,5,9–11,14,15,17-19] Difficulty with chewing was mentioned in four studies, whereas purulent discharge and xerostomia were each described in one study, highlighting their rarity.[1,6,7,11]

Pain was typically throbbing in quality, peaking within the first 24 hours and subsiding progressively over several days.[6,7,11,17] The typical clinical pattern included unilateral or bilateral parotid swelling lasting 3–7 days, separated by symptom-free intervals.[6,7,10]

A case–control study involving 128 children confirmed reduced masticatory efficiency and preference for soft diets among affected patients, with ≥2–3 painful episodes lasting ≥4 days, in the absence of ductal obstruction.[9] Across all 17 studies, painful recurrent swelling, intermittent fever, and multiple relapses were the most consistent features, although episode frequency and duration varied widely.[1,6,7,10,11,15–18]

Summary frequencies and proportions are visualized in **Figure 5**.

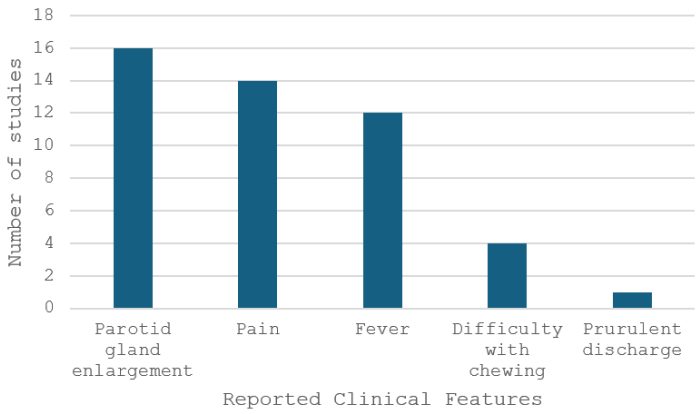

Figure 5 – Clinical manifestations of JRP
Legend: Bar chart illustrating the number of studies reporting each major clinical feature of juvenile recurrent parotitis (JRP).

Diagnostic Approaches

Across the included studies, definitions of JRP varied slightly, but most required at least two episodes of non-suppurative parotid swelling before puberty (<16 years old), after excluding obstructive lesions, autoimmune disorders such as Sjögren syndrome, and other pediatric causes.[1,3–8,10,11,14,15,17,18]

Parotid US was the most commonly used diagnostic method, reported in 16 of the 17 studies.[1,3–11,14,15,17,18,22] When quantitative data were available, US was performed in about 97% of all documented cases (n ≈ 756/778), confirming its key role in the diagnosis. Typical US findings included multiple hypoechoic foci consistent with sialectasias, heterogeneous or hypoechoic parenchymal texture, and enlarged intraparotid lymph nodes.[1,3-11,14,15,17,18,22] US was consistently used as the initial investigation due to its accessibility, safety, and high sensitivity for characteristic parenchymal and ductal changes.

Magnetic resonance imaging (MRI) or computed tomography (CT) were reported in seven studies.[1,10,11,14,15,17,18] These imaging modalities were generally reserved for atypical or inconclusive cases, involving approximately 95–110 patients. MRI provided detailed parenchymal characterization and helped distinguish JRP from autoimmune sialadenitis,

while CT was used selectively, mainly in complex or pre-surgical evaluations, due to concerns about radiation exposure in children.

Sialography was documented in seven studies. It was most often performed during quiescent phases or as part of interventional protocols, demonstrating multiple sialectasias and occasionally serving as a therapeutic adjunct through ductal lavage. Sialography is a purely radiological technique used mainly for diagnostic mapping.[1,5,10,14,15,17,18] Sialendoscopy was reported across several studies as a combined diagnostic and therapeutic tool, effectively reducing recurrence and preserving gland function.[1,5,9–11,14,15,17,18]

Laboratory investigations — including complete blood count, biochemistry, inflammatory markers, amylase, viral serologies, immunoglobulin quantification, and autoantibody testing (ANA, ENA, SSA, SSB) — were described in five studies.[1,6,10,15,17] They were performed mainly to exclude other differential diagnoses and had limited value in confirming JRP.

Biopsies or ductal aspirates were rarely performed and generally provided limited diagnostic value.[1]

The distribution and frequency of diagnostic modalities across studies are summarized in **Table 2**.

Table 2 - Diagnostic Approaches of JRP.

Diagnostic Method	Number of Studies Reporting	Main Findings / Role in JRP	Advantages	Limitations
US	17[1,3–8,9–11,14,15,17,18,22]	Most frequently used; detects multiple hypoechoic areas, sialectasis, heterogeneous parenchyma, intraparotid lymph nodes	Non-invasive, widely available, no radiation, high sensitivity for ductal/parenchymal changes	Operator-dependent; less detailed ductal anatomy than sialography
MRI	7 [1,10,11,14,15,17,18]	Used for detailed parenchymal assessment and differentiation from autoimmune diseases (e.g., Sjögren's)	Superior soft-tissue contrast; no radiation	Higher cost, limited availability, longer acquisition time, need for sedation in children
CT	7 [1,10,11,14,15,17,18]	Rarely used; reserved for complex cases where MRI unavailable	Good anatomical detail	Ionizing radiation; not first-line in children
Sialography	7 [1,5,10,14,15,17,18]	Demonstrates multiple sialectasis; can have adjuvant therapeutic effect; used in quiescent phase or before intervention	Detailed ductal anatomy; possible therapeutic benefit	Invasive; contrast; discomfort; contraindicated in acute phase
Sialendoscopy (diagnostic)	>10 - reported across interventional case series[1,5,9–11,14,15,17,18]	Direct visualization of ductal stenosis, mucous plugs, sialectasis	Diagnostic and therapeutic potential; no radiation	Requires anesthesia; limited availability; invasive
Laboratory Workup	5[1,6,10,15,17]	CBC, CRP, amylase, viral serologies, immunoglobulins, ANA/ENA/SSA/SSB; mainly for exclusion of other causes	Useful to rule out autoimmune/infectious etiologies	Low diagnostic yield for JRP; should be guided by clinical suspicion
Biopsy / Ductal Aspiration	1[1]	Generally non-contributory; reserved for atypical or suspicious cases	Definitive histology if needed	Invasive; not routinely indicated

Legend: CBC – Complete blood count | CRP – C-reactive protein | ANA – Antinuclear antibodies | ENA – Extractable nuclear antigen antibodies | SSA/SSB – Anti-SSA (Ro) and anti-SSB (La) antibodies | JRP - Juvenile recurrent parotitis. This table summarizes the diagnostic tools reported in the 17 included studies on juvenile recurrent parotitis (JRP), highlighting their frequency of use, purpose, and characteristic findings. Ultrasonography (US) was the most widely used first-line modality, providing detailed evaluation of parenchymal and ductal changes such as sialectasias and lymphadenopathy. Magnetic resonance imaging (MRI) and computed tomography (CT) were reserved for atypical or inconclusive cases, whereas sialography was often used during quiescent phases or as part of therapeutic protocols. Laboratory investigations primarily served to exclude alternative etiologies.

Therapeutic Interventions

Across the included studies, therapeutic strategies for JRP varied significantly in invasiveness, follow-up duration, and outcome definitions, which prevented quantitative pooling. Therefore, the results were summarized qualitatively in **Table 3**. The most commonly reported interventions included sialendoscopy (n = 10), conservative management (n = 11), corticosteroids (n = 5), antibiotics (n = 8), parotid duct irrigation (n = 4), and surgical resection (n = 7). Several studies, especially those involving patients with mild or infrequent episodes, reported no active intervention.

Conservative management (n = 11) was the primary approach in most groups.[1,3,6–8,10,11,14,15,17,18] It involved non-steroidal anti-inflammatory drugs, hydration, warm compresses, gland massage, and sialogogues. Antibiotics (n = 8) were used selectively when purulent discharge or bacterial infection was suspected.[1,3,6–8,10,11,15] Patients generally reported symptomatic improvement, but data on frequency reduction varied and follow-up periods were short.

Therapeutic sialendoscopy (n = 10) was the most commonly

described interventional method.[5,6,8,10,11,14,15,17–19] Procedures typically combined ductal dilation, saline irrigation, and intraductal corticosteroid instillation under general anesthesia. Across studies, 70–100% of patients experienced a reduction in recurrence frequency and symptom duration within 6–24 months of follow-up. Reported complications were rare, including transient glandular swelling (3–5%) and minor ductal trauma (<2%), all resolving without lasting effects.

Intraductal instillation without full endoscopy (n = 4) involved saline and corticosteroid lavage via catheterization.[6,10,15,17] Symptomatic relief was achieved in about half of the patients, but recurrence generally returned within 6–12 months, indicating a less durable benefit compared with complete sialendoscopy.

Systemic corticosteroid therapy (n = 5) was used either during acute flares or for short courses in recurrent cases.[1,6,10,16,17] Most studies reported temporary improvement, but recurrence rates remained high after discontinuation. No significant long-term preventive effect was demonstrated. Adverse events were mild and transient (e.g., irritability, sleep disturbance).

Parotid duct irrigation (n = 4) performed with saline, sometimes combined with intraductal corticosteroids, resulted in complete remission in 30–44% of patients and partial improvement in the rest.[6,10,15,17] Follow-up ranged from six months to two years, with no major complications reported.

Surgical resection (n = 7) — primarily superficial parotidectomy — was used for refractory or severely symptomatic cases.[3,5,11,15,17–19] Outcomes were generally positive, with most patients experiencing resolution or significant reduction of recurrences. However, postoperative complications occurred in 8–15%, including transient facial nerve paresis, Frey's syndrome, and sialocele formation.

Across the available evidence, conservative and minimally invasive interventions showed consistent symptomatic improvement, while the durability of recurrence varied among techniques. The differences in reporting formats (e.g., episode frequency, duration, pain scores) limited data pooling, preventing meta-analytic synthesis.

Table 3 - Therapeutic Interventions of JRP.

Intervention	No. of Studies Reporting	Typical Approach	Reported Outcomes	Durability of effect	Reported complications
Sialendoscopy	11 [5,6,8,10,11,14,15,17–19]	Minimally invasive endoscopic dilation, duct irrigation with saline ± intraductal corticosteroids; removal of mucus plugs/debris	70–100 % reduction in recurrence frequency and symptom duration; improved gland function	Sustained remission for 6–24 months in most reports	Transient gland swelling (3–5 %), minor ductal trauma (< 2 %), no permanent sequelae
Conservative management	11 [1,3,6–8,10,11,14,15,17,18]	NSAIDs/analgesics, hydration, gland massage, sialogogues, warm compresses; antibiotics if bacterial infection suspected	Symptomatic relief in acute flares; improvement in most cohorts; spontaneous remission frequent in adolescence	Variable (weeks–months); recurrence common in moderate–severe disease	None reported
Corticosteroids	6 [1,6,10,16,17]	Short oral courses during acute or recurrent flares	Temporary symptom control and reduced inflammation; high relapse after discontinuation	Short-term effect only	Mild transient effects (irritability, sleep disturbance
Antibiotics	8 [1,3,6–8,10,11,15]	Oral or intravenous therapy for suspected bacterial infection	Temporary improvement during purulent or febrile episodes; no evidence for prophylactic efficacy	Short-term only	Occasional gastrointestinal discomfort
Parotid duct irrigation	4 [6,10,15,17]	Catheter-based saline irrigation ± corticosteroids under local or general anesthesia	Complete remission in 30–44 % of patients; partial improvement in remainder	Improvement maintained for 6–24 months	None reported
Surgical resection (superficial parotidectomy)	7 [3,5,11,15,17–19]	Partial gland excision for refractory or function-limiting disease	Marked or complete symptom resolution in most cases	Long-term remission; very low recurrence	Facial nerve paresis (8–15 %), Frey's syndrome, sialocele formation

Legend: This table summarizes the treatment approaches described in the included studies, including conservative management, medical therapy, ductal interventions, and surgery. Sialendoscopy emerged as the most frequently reported and effective intervention, associated with sustained reductions in episode frequency and severity and minimal complications. Conservative management and supportive care were commonly used as first-line strategies, while surgical resection was reserved for refractory cases. Data were synthesized qualitatively due to heterogeneity in study design, outcome definitions, and follow-up duration.

Quality Assessment of Included Studies

Overall, the quality of evidence was moderate to high across most studies.

Most retrospective case series (n = 12) scored between 7/10 and 9/10, demonstrating strengths such as clearly defined inclusion criteria, consistent diagnostic confirmation, and detailed clinical descriptions. Two studies showed lower methodological robustness (4/10 and 6/10), mainly due to limited follow-up and incomplete reporting of outcomes.The case–control study scored 10/10, reflecting excellent methodological accuracy, appropriate selection of controls, and clear diagnostic criteria, although - as in most observational designs - residual confounding cannot be fully excluded.

The cohort studies (n = 2) showed greater variability, with scores ranging from 4.5/11 to 8/11. Their main limitations included retrospective data collection, incomplete long-term follow-up, and limited adjustment for confounding factors.

The analytical cross-sectional studies (n = 2) scored 6/8 and 8/8, indicating overall high methodological quality. Both studies used clearly defined inclusion criteria and validated diagnostic procedures, although the lack of control for confounders and the absence of longitudinal assessment limited causal inference.

No studies were excluded based on the risk-of-bias assessment.

DISCUSSION

Clinical and Pathophysiological Insights

JRP is a benign, self-limiting inflammatory disorder of childhood, marked by recurrent, non-purulent parotid swelling and pain.[1,5,17] Imaging findings reported across the included studies - such as mucous plugs, ductal debris and sialectasis - support a pathophysiological mechanism of transient ductal obstruction leading to episodic inflammation and temporary glandular dysfunction.[16,18] The characteristic triad of recurrent swelling, pain, and intermittent fever reflects an intermittent inflammatory process rather than persistent mechanical obstruction.[16,24] The marked variability in episode frequency and severity among patients suggests differences in ductal anatomy or immune response.[12,22]

Thick saliva or mucopurulent discharge, occasionally described in primary reports, further supports transient salivary stasis. In contrast frank purulence discharge and xerostomia remain rare, reinforcing the predominantly non-bacterial nature of the disorder.[16,18]

Epidemiology and Risk Factors

Although uncommon in hospital-based series, JRP is likely underdiagnosed, as milder cases may not reach tertiary centres.[16,22]

Several early-life factors - including prematurity, low birth weight, neonatal infections, early antibiotic exposure, and younger maternal age - were more frequently reported among affected children, suggesting a possible developmental susceptibility.[16,22]

A higher prevalence in boys and a typical onset between three and six years were consistent findings across studies.[3,8,24]

Bilateral or alternating gland involvement, frequently documented, supports a systemic or multifocal process rather than a single-duct obstruction.[6,17,18]

A relapsing–remitting pattern with spontaneous resolution around puberty was a common observation in primary cohorts.[12,21]

Functional impairments - such as lower masticatory efficiency or preference for soft diets - were reported in some children, suggesting a potential role of reduced mechanical stimulation in salivary stasis.[22] Preventive strategies described in these studies included firmer foods, adequate hydration and regular gland massage.[22]

Clinical Implications

Diagnostic approaches were highly consistent across the included studies. Diagnosis was predominantly clinical, supported by US as the first-line imaging modality. Ultrasound reliably demonstrated sialectasis, heterogeneous parenchyma, and intraparotid lymphadenopathy, while avoiding radiation exposure.[9,10,14,15,17,21,22]

MRI was selectively used in atypical presentations or to exclude autoimmune or infiltrative disease.[14,18,24] Sialography, though less frequently used, remained helpful in selected cases, particularly during quiescent phases, for identifying ductal irregularities and enabling lavage.[14,18,22] CT was restricted for complex cases or pre-surgical assessments due to radiation concerns.[14,18]

Laboratory tests—including inflammatory markers, immunoglobulins and autoantibodies—were performed selectively to exclude alternative diagnoses rather than as routine investigations.[14,18,22]

Biopsy and ductal aspirates were rarely required.[22]

Therefore, a standardized diagnostic pathway is recommended, emphasizing:

1. Clearly defined clinical criteria;
2. Early US as the cornerstone of evaluation;
3. Selective use of MRI and sialography;
4. Targeted laboratory testing guided by clinical suspicion.

Therapeutic Approach and Management Considerations

Management strategies across primary studies followed a stepwise escalation model. Conservative measures—including hydration, analgesia, gland massage, warm compresses, and sialogogues— were the predominant first-line approach and were often sufficient until spontaneous remission occurred. These interventions address both functional impairment and inflammatory activity while aligning with the benign natural history of the condition.

Dietary couseling and parental education are also important, as stimulating salivary flow through firmer foods and regular massage may reduce stasis and prevent recurrence.

When symptoms become frequent, prolonged, or disabling, therapeutic sialendoscopy is the preferred next step. This minimally invasive procedure allows for ductal dilation, lavage, and removal of mucous plugs, directly targeting the underlying mechanism of ductal obstruction and sialectasis.[14,18,22] Adjunctive intraductal corticosteroid instillation may further reduce local inflammation and prolong symptom-free periods, particulary in children with severe or recurrent cases.[15,17,25] Across studies, reported complications were rare and mild, most often transient swelling or discomfort, supporting the safety of this procedure when performed by experienced teams.[14,18,22]

Systemic corticosteroids may shorten the duration of acute flares but have limited effectiveness in preventing recurrence.[16,24] Therefore, their use should be limited to managing symptoms during the flare rather than for long-term prevention. Antibiotics should be used only when there is clear clinical or microbiological evidence of bacterial superinfection.

Surgical intervention, especially superficial parotidectomy, was rarely indicated and should only be considered in refractory cases associated with significant morbidity or functional impairment.[18] Due to potential risks—such as facial nerve injury and salivary fistula—surgery should remain a last-resort option.

Overall, current evidence supports a conservative-first strategy, escalating to minimally invasive intervention only for recurrent or debilitating disease, aligning with the natural history of JRP.

Strengths and Limitations

This systematic review compiles data from 17 studies conducted across various geographic and methodological settings, providing a thorough overview of the clinical, diagnostic, and therapeutic aspects of JRP. Including interventional data improves clinical relevance and offers useful insights into real-world management strategies.

Nevertheless, several methodological limitations must be acknowledged. Most included studies were retrospective, with small to moderate sample sizes, heterogeneous diagnostic criteria, and inconsistent outcome reporting, which prevented quantitative synthesis. Follow-up duration and control of confounding factors were often inadequate, and publication bias toward tertiary-care experiences may have resulted in an overestimation of interventional success.

Another limitation is the potential overlap of primary data between this review and previous narrative or scoping reviews used during the reference screening. Although these secondary sources were not included in the main synthesis, their bibliographies helped ensure search completeness, so some indirect duplication cannot be entirely ruled out.

Despite these limitations, the consistency of key findings—particularly regarding clinical presentation, USfeatures, and response to conservative and endoscopic therapies—supports the overall strength of the conclusions and highlights the clinical significance of current evidence on pediatric JRP.

Future Perspectives

Future research should move beyond isolated retrospective series toward prospective, multicenter studies that use standardized diagnostic definitions and outcome measures. Randomized controlled trials comparing conservative treatment and sialendoscopy—with and without corticosteroid instillation—are necessary to determine long-term efficacy, cost-effectiveness, and the optimal timing for intervention.

Future protocols should adopt shared reporting metrics, such as recurrence rate, episode duration, pain scores, hospitalization frequency, antibiotic use, and quality-of-life indices, and ensure extended follow-up to monitor recurrence and glandular function. International registries could facilitate comprehensive data collection, minimize variability, and support the development of evidence-based guidelines for pediatric JRP.

CONCLUSION

JRP is an uncommon yet clinically relevant pediatric condition characterized by recurrent, non-suppurative parotid swelling and pain, often impacting quality of life despite its benign and self-limiting nature.[1,3–8,10,11,14–18,22]

US remains the diagnostic gold standard, reliably identifying sialectasis and parenchymal changes without radiation exposure.[9–11,14,15,17,18,20–22]

Management should follow a stepwise approach—beginning with conservative measures and progressing to minimally invasive options, particularly sialendoscopy with or without intraductal corticosteroid instillation, which demonstrates high efficacy and safety.[5,6,10,11,14,15,17–19,21] Surgical intervention is reserved for refractory cases.[3,5,11,15,17–19]

Although many patients experience remission around puberty, structured diagnostic pathways and judicious treatment escalation remain key to optimizing outcomes and minimizing morbidity.[1,5–8,10-12,14–18,21,22]

ABBREVIATION DEFINITION

JRP	Juvenile recurrent parotitis / Parotidite recorrente juvenil
US	Ultrasonography / Ecografia
MRI	Magnetic resonance imaging / Ressonância magnética
CT	Computed tomography / Tomografia computorizada

CBC	Complete blood count / Hemograma completo
CRP	C-reactive protein / Proteína C-reativa
ANA	Antinuclear antibodies / Anticorpos antinucleares
ENA	Extractable nuclear antigen antibodies / Anticorpos anti-antigénios nucleares extraíveis
SSA	Anti-SSA (Ro) antibodies / Anticorpos anti-SSA (Ro)
SSB	Anti-SSB (La) antibodies / Anticorpos anti-SSB (La)

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