



Arthroscopic Versus Open Irrigation and Debridement for Acute Shoulder Septic Arthritis: A Propensity-Matched Retrospective Cohort Study



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Introduction:

- Native glenohumeral septic arthritis remains a serious clinical problem requiring prompt surgical drainage.
- Whether arthroscopic or open irrigation and debridement (I&D) yields better outcomes remains controversial.
- We used a large health record network to compare outcomes following arthroscopic versus open I&D for native shoulder septic arthritis, using propensity score matching (PSM).
- We hypothesized that arthroscopic I&D would yield lower repeat-debridement rates and comparable or better short-term outcomes relative to open arthrotomy.

Materials and Methods:

- We queried the TriNetX US Collaborative Network for adults diagnosed with native shoulder septic arthritis (identified by ICD codes) who underwent either arthroscopic or open I&D. Patients were 1:1 propensity-matched on age, sex, race, key comorbidities, and baseline characteristics. (**Figure 1**)
- The primary outcomes were reoperation for infection (repeat I&D), persistent infection-related events, and mortality at 30 days and 1 year.
- Secondary outcomes included healthcare utilization (hospital readmissions, ICU admissions), systemic complications (sepsis, thrombosis, pulmonary complications, etc.), and sequelae such as glenohumeral arthritis, osteomyelitis, new rotator cuff tear, and adhesive capsulitis.
- Categorical outcomes were compared using chi-square tests and odds ratios; continuous variables were compared using t-tests, with significance set at p<0.05.

Results:

- After matching, patient demographics and comorbidities were well-balanced between the arthroscopic and open groups. (**Table 1**)
- The mean age was approximately 59 years, with a male predominance in both cohorts. After matching, 664 patients were included in each cohort.
- Repeat I&D within 30 days occurred more frequently after open surgery than after arthroscopy (13.0% vs. 4.3%; OR: 3.25; p<0.001). Additionally, open I&D was associated with higher rates of surgical site infection (17.2% vs. 9.0%; OR: 2.07; p=0.002), osteomyelitis within 30 days (15.5% vs. 8.9%; OR: 1.88; p=0.001), and need for blood transfusion (16.7% vs. 11.7%; OR: 1.5; p=0.01) compared to the arthroscopic group. (**Table 2**)
- In contrast, all-cause 30-day readmissions were lower after open debridement compared to arthroscopic debridement (14.0% vs. 22.1%; OR: 0.52, p=0.02).
- Mortality did not differ at 30 days (4.5% vs. 4.5%, OR: 1, p=1) or at 1 year (15.1% vs. 13.6%; OR: 1.1, p=0.5).
- At 1 year, odds of repeat I&D remained higher in the open group compared to the arthroscopic group (13.5% vs. 7.0%; OR: 2.1; p=0.02). (**Table 3**)
- Risk of Osteomyelitis at 1 year was higher after open debridement compared to arthroscopic debridement (16.2% vs 11.4%; OR: 1.5, p=0.05).
- Systemic complications were uncommon and generally similar between groups. Sequelae and complications, such as new rotator cuff tears or adhesive capsulitis, were infrequent and similar in both cohorts.

Table 1: Demographics and Clinical Characteristics Before and After Matching

Characteristic	Unmatched		Matched	
	Open (N= 974)	Arthroscopy (N=766)	Open (N=664)	Arthroscopy (N=664)
Age at Index				
Age (mean ± SD)	57.0 ± 20.1	60.2 ± 17.7	58.7 ± 18.6	59.4± 17.8
Gender				
Female (%)	38.2	37.2	35.8	36.8
Race and Ethnicity				
Hispanic/Latino (%)	9.1	7	8.4	7.4
White (%)	61.6	68.9	70.3	69.1
Black (%)	12.6	17.0	15.8	15.2
Asian (%)	10	5.5	4.9	6
Lifestyle				
BMI (mean ± SD)	28.3 ± 7.2	28.2 ± 7.6	28.2 ± 7.4	28.3 ± 7.5
Nicotine dependence (%)	19.9	20.7	23.3	20.2
Comorbidities				
Hypertension (%)	54.1	62.7	59.7	59.7
Diabetes mellitus (%)	33.7	36.5	35.5	35.6
Kidney disease (%)	36.3	39.8	39.7	38.7
Liver disease (%)	12.6	13.5	13.8	13.5
Hypothyroidism (%)	9.3	12	10.5	11.5
Hyperparathyroidism (%)	1.1	1.3	1.5	1.5
Heart failure (%)	19.7	25.0	23.8	23.6
Respiratory diseases (%)	19.2	20.6	21.0	20.6
Malnutrition (%)	12.3	12.6	14.1	13.4
Neoplasms (%)	19.6	20.5	20.4	20.4
Cerebrovascular diseases (%)	8.9	8.5	9.1	8.8
Osteoporosis (%)	5.7	5.0	5.2	5.1
Carrier of MRSA (%)	2.1	1.6	1.6	1.8
Surgery and Medication				
Transplanted organ (%)	1.4	2.9	1.9	2.1
Spleen excision (%)	0	0	0	0
Antibacterial use (%)	77.1	77	76.2	76.8
Corticosteroid use (%)	46.7	57	53.0	53.9
Anti-neoplasm/Chemotherapy (%)	11.6	11.2	10.5	11.7

Figure 1: Study Summary

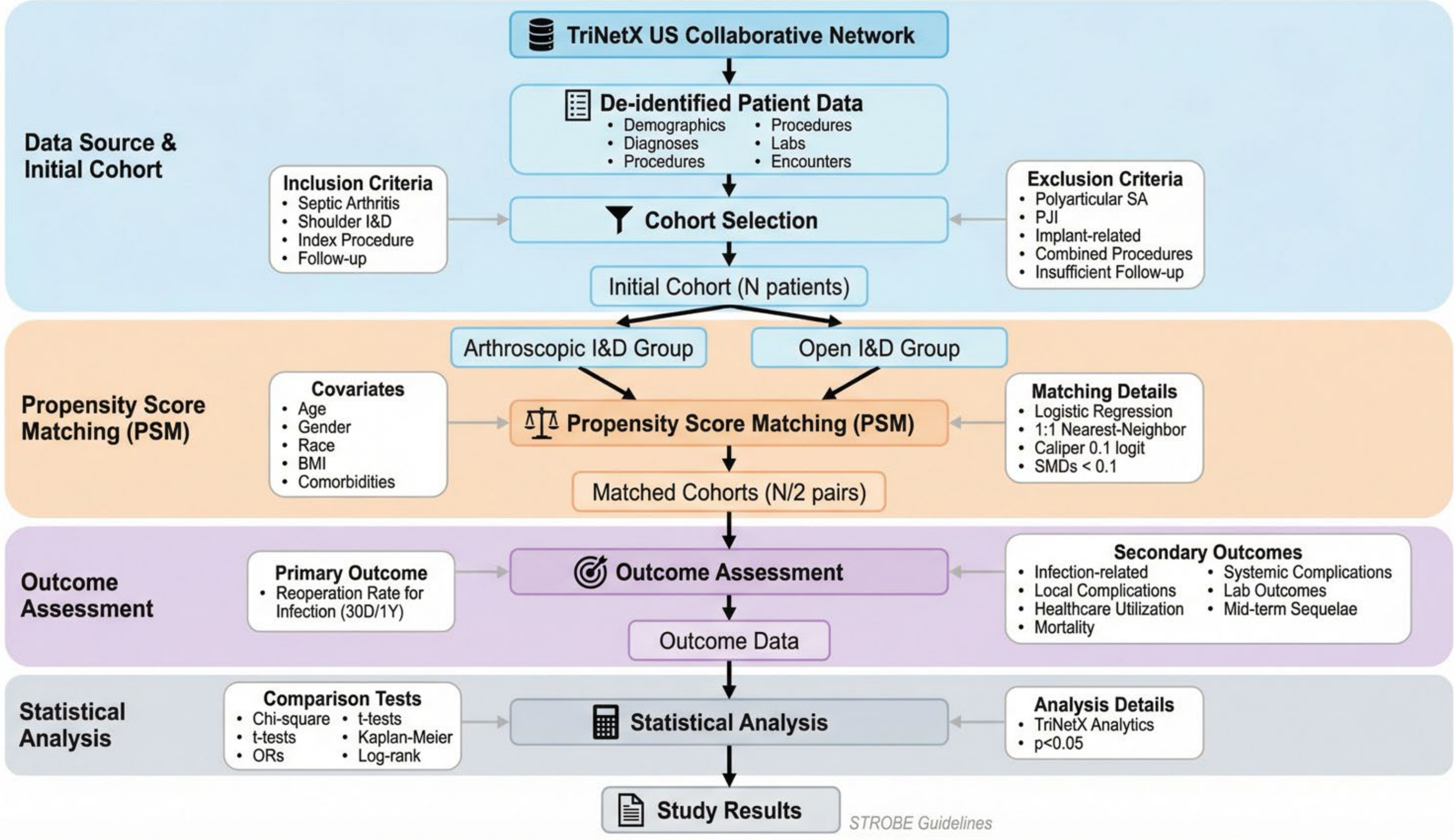


Table 2: Primary and Secondary Outcomes at 30-Days

30 Day Outcomes	Open (%)	Arthroscopy (%)	OR	P-Value
Primary Outcome				
Reoperation (repeat I&D)	13	4.3	3.25	<0.001
Secondary Outcomes				
Readmissions	14	22.1	0.52	0.02
ICU Admission	5	3.5	1.32	0.4
Mortality	4.5	4.5	1	1
Sepsis/Bacteremia	10.1	7.3	1.42	0.2
Surgical Site Infection (SSI)	17.2	9.0	2.07	0.002
Transfusion Requirement	16.7	11.7	1.5	0.01
Osteomyelitis	15.5	8.9	1.88	0.001
DVT	2.1	1.7	1.18	0.8
All VTE	3.0	3.0	1	0.9

Table 3: Primary and Secondary Outcomes at 1 Year

1 Year Outcomes	Open (%)	Arthroscopy (%)	OR	P-Value
Primary Outcome				
Reoperation (repeat I&D)	13.5	7	2.1	0.02
Secondary Outcomes				
Mortality	15.1	13.6	1.12	0.5
Rotator Cuff Tear	7.4	5.9	1.27	0.4
Adhesive Capsulitis/Shoulder Stiffness	3.9	4.8	0.81	0.5
Osteomyelitis	16.2	11.4	1.5	0.05
Shoulder Osteoarthritis	12.5	9.6	1.34	0.2

Conclusions:

- In this large propensity-matched, real-world cohort, our results suggest arthroscopic I&D for native shoulder septic arthritis was associated with significantly lower short-term and 1-year reoperation rates and lower local infectious complications compared with open I&D, with no difference in mortality.
- Given the advantages of minimally invasive surgery, our findings may support the use of arthroscopic I&D as a first-line approach in many patients, although surgeon judgment and patient factors remain paramount.
- Importantly, our results should be interpreted in light of the limitations of retrospective database analyses.
 - Key clinical factors not captured by our analysis may contribute to residual confounding and selection bias despite propensity matching.
 - Additionally, future correlation with clinical, radiographic, and functional outcomes are necessary.

Clinical Pearls:

Arthroscopy-first approach: When technically feasible and in the absence of extensive abscess burden or advanced osteomyelitis, arthroscopic I&D may be favored for native shoulder septic arthritis due to lower rates of repeat surgery and local infectious complications.
Patient selection matters: Open I&D remains appropriate for patients with extensive extra-articular involvement, posterior compartment disease, or suspected bone involvement, where exposure and source control may require an open approach.
Anticipate post-discharge needs: Higher short-term readmissions following arthroscopy likely reflect earlier discharge and post-acute care needs rather than inferior infection control; proactive coordination of antibiotics, vascular access care, and follow-up may mitigate readmissions.
Functional recovery remains a priority: Procedural choice should be paired with early rehabilitation planning and close monitoring for stiffness and cuff pathology, as functional outcomes were not captured in this analysis.

Supplemental Figures



References



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