DETECTION OF TRAUMATIC ARTHROTOMY OF THE WRIST USING THE SALINE LOAD TEST


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Objectives
- Joint penetration of periarticular wrist injuries can be difficult to ascertain in the emergent setting.
- Diagnosing traumatic violation of the wrist capsule can be critical to management and prevention of septic arthritis.
- The saline load test is a minimally invasive procedure that can be easily performed in the triage setting.
- Therefore, the purposes of this study are to identify the minimum fluid volume necessary to obtain 95% sensitivity for joint penetration in vivo, and to correlate the fluid volume needed for positive diagnosis with demographic factors.

Methods
- 30 consecutive patients scheduled for elective outpatient wrist arthroscopy were prospectively enrolled
- Patients with previous ipsilateral wrist surgery were excluded
- Technique:
  1) Standard 3-4 portal of 5mm was established under traction, but without joint insufflation.
  2) The arthroscope was then inserted and under direct visualization, an 18-gauge needle was inserted in the 6R portal.
  3) The arthroscope and trocar were then removed, traction released
  4) Sterile saline was steadily injected until there was effusion from the 3/4 arthrotomy site.
- Statistics: Logarithmic regression was used to analyze the saline load test volumes and to determine the sensitivity for a positive result

Results
- In 30 consecutive patients that underwent the saline load test, it took an average volume of 0.74ml to achieve a positive result and induce effusion through the 3/4 arthrotomy site.
- The amount of fluid needed to obtain a positive result ranged from 0.2ml-3.5ml, with a standard deviation of 0.69.
- No correlation was observed between the gender, height, weight, or body mass index (BMI) of the patients and the amount of saline injected.

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<tr>
<th>Volume Injected</th>
<th>Sensitivity of Saline Load Test</th>
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<tr>
<td>0.5ml</td>
<td>70%</td>
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<tr>
<td>1ml</td>
<td>80%</td>
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<tr>
<td>3ml</td>
<td>95%</td>
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Conclusion
This study demonstrates that only 1ml of saline needs to be injected for the saline load test to identify a majority of traumatic wrist arthrotomies. However, 3ml will need to be injected into the wrist to detect 95% of wrist arthrotomies. These values are applicable to a wide array of patients of both genders and with different height, weights, and BMIs, as there was no correlation between patient demographics and the amount injected to obtain a positive result.

Disclosures
The authors have no conflict of interest related to the content of this study.