We used a saline load test in 50 consecutive patients with periarticular lacerations suggestive of joint penetration. The surgeon had predicted on clinical grounds whether or not the laceration penetrated the joint.

Joint penetration was demonstrated in 14 and was absent in 36. A comparison of the prediction and the test results showed that there were false-positive clinical results in 39% and false-negative in 43%. There were no complications from the use of the test.

Our findings support the use of a saline load test in evaluating periarticular lacerations.

Lacerations adjacent to joints may result in intra-articular penetration and contamination. Clinical assessment of such injuries is often performed in the accident and emergency department. If a periarticular laceration does not penetrate the joint, treatment usually consists of local irrigation, debridement and closure. Penetration of the joint, however, indicates the need for a more extensive operation.

We have carried out saline injections into joints to determine the most appropriate treatment, but there are no data available on the efficacy or safety of such a procedure. We therefore performed a prospective study of 50 consec-

<table>
<thead>
<tr>
<th>Saline load test</th>
<th>Clinical prediction</th>
<th>% Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative 36</td>
<td>Negative 22</td>
<td>39</td>
</tr>
<tr>
<td>Positive 14</td>
<td>Positive 8</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Negative 6</td>
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<tr>
<td>Total 50</td>
<td>50</td>
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</tbody>
</table>

Table I. The results of clinical prediction and the saline load test in 50 patients

PATIENTS AND METHODS

We studied 50 consecutive patients with periarticular lacerations with possible joint penetration over a period of one year at the Emanuel Hospital and the Oregon Health Sciences University in Portland. Forty had an injury of the knee, four of the elbow, two of the ankle, two of the wrist and two of the proximal interphalangeal joints of the hand. Thirty-nine of the injuries had been caused by road-traffic accidents, seven by falls, two by bicycle accidents, one by a gunshot wound and one by stabbing.

We determined the likelihood of penetration on clinical grounds and the patients then had saline injections. The results of the injection were compared with the opinion before injection.

The injection was made under sterile conditions, access to the joint being obtained via standard portals and through uninjured tissue. Sterile saline was injected and the joint examined for evidence of leakage of fluid, both statically and with passive movement. The amount of saline injected was related to the size of the joint; approximately 60 ml were used for the knee, 20 ml for the ankle and elbow, 5 ml for the wrist and 1 to 2 ml for finger joints. Leakage of fluid indicated a positive test. A negative test was distention of the joint without evidence of leakage to the point of increasing resistance or, in a conscious patient, to the point of discomfort.

RESULTS

In 36 patients no leakage was detected. In 14 of these the clinical impression before saline injection had been of damage to the joint; there was an error in clinical diagnosis.
in 39%. In 14 there was leakage of fluid. Six of these patients had been judged not to have damaged the joint, which indicated an error in 43%. Treatment was therefore altered for 40% of the patients on the basis of the findings of the saline injection (Table I).

There were no complications from the procedure, although one patient with preinjection penetration subsequently developed septic arthritis which required further surgery. There were no late complications and no subsequent infections in the joints not irrigated or explored because of information obtained by this test.

DISCUSSION

Patzakis et al (1975) described the ‘saline load test’, but there are no published data regarding the efficacy and safety of the procedure (Leffers 1992).

Traumatic arthroscopy is potentially serious. Injuries may range from minor damage to the joint capsule with the risk of infection to major injuries involving fractures of osteochondral surfaces. Our study has shown that clinical evaluation to determine if a periarticular laceration has penetrated the joint is often incorrect. The saline injection test is therefore of value in such injuries.

Marvel and Marsh (1977) studied 121 traumatic arthroto-
mies and showed that these injuries required early aggres-
sive surgical treatment and that prompt action on the basis of clinical judgement alone was important. They concluded that the ultimate outcome was related to the extent of the injury as well as to the early recognition of joint involvement and surgical intervention. A study of nail-gun injuries of the knee has suggested that open debridement in the operating theatre is better than irrigation in the accident and emergency department (Levy et al 1991). A comparison of open and arthroscopic treatment of penetrating injuries of the knee has shown good results with either technique, but there was faster recovery after arthroscopic management (Raskind and Marder 1993).

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES


