Ureteral injury incident to lumbar disc surgery

Case report

MAURO P. GANGAI, M.D., F.A.C.S.
Department of Surgery, Division of Urology, U.S. Army
Tripler General Hospital, Honolulu, Hawaii

A case is reported in which combined vascular and ureteral injury occurred during lumbar disc surgery. The mechanism of injury is described and the importance of its early recognition emphasized.

KEY WORDS: herniated intervertebral disc • surgery • ureteral injury • vascular injury

Whenever ureteral injuries are discussed which have occurred subsequent to surgical procedures, the thoughts of the urologist almost invariably are focused on the pelvis where injuries most commonly occur following either gynecological surgery or extensive general surgical procedures in the pelvis. Excluding these and other ureteral injuries from penetrating wounds or external blunt trauma, the causes for ureteral injury become increasingly more unusual or bizarre.

The purpose of this paper is to present an unusual ureteral injury that followed trans-lumbar excision of a herniated disc. The literature will be reviewed and the mechanism of injury described.

Case Report

This patient was a 34-year-old woman with symptoms, physical findings, and x-ray evidence of a right L4-5 disc herniation. A hemilaminectomy with removal of a degenerated disc was performed at the L4-5 level using the pituitary rongeur. The neurosurgeon felt the procedure was completely uneventful in all respects. Because of postoperative ileus, abdominal distention, and a drop in hematocrit noted on the 4th postoperative day, an excretory urogram (IVP) was obtained (Fig. 1). Gross extravasation was evident from the left ureter at the L4-5 level. It was the impression at that time that a combined ureteral and vascular injury had occurred, and immediate exploration was carried out. A tear in the left iliac vein was uncovered and repaired with 5–0 arterial silk. The ureteral injury consisted of a bite taken out of the postcrumediacl aspect of the ureter at the L4-5 level without complete transaction (Fig. 2). Repair was accomplished by passing a Silastic splint in a retrograde fashion from the bladder to the renal pelvis. This was brought out suprapubically along with a Silastic Malecot catheter and was maintained for 27 days. No permanent vascular deficits ensued and an IVP 1 year postoperative was normal.

Discussion

The neurosurgical complication just described has been reported in detail only five
Uretal injury in lumbar disc surgery

Fig. 1. Left: One-hour delayed IVP on 4th postoperative day revealing extravasation at L4-5 level. Right: Normal IVP 1 year later.

times previously (Table 1). The pituitary rongeur was used in all cases. Either side may be injured but the left appears to be more vulnerable. The mechanism of injury is perforation of the anterior longitudinal spinal ligament by the pituitary rongeur as the operator attempts to either explore or clean out the disc space. As this occurs in the L4-5 or L5-S1 disc space, the close anatomical relationship of the iliac vessels and ureter to the anterior vertebral column makes these structures vulnerable. Vascular injury via this route has been reported many times. The ureter, however, because of its mobility and surrounding loose fatty and connective tissue, is much less prone to injury. Combined vascular and ureteral injury, as was present in this case, has been reported only twice previously.

Because of its limited opening, the rongeur usually removes a bite of tissue from the ureter, although in two of the reported cases

Fig. 2 Drawing of the posterior view to show the level (left) and mechanism (right) of the injury.
TABLE 1
Summary of six cases of ureteral injury

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Ureteral Injury</th>
<th>Side</th>
<th>Assoc. Vasc. Injury</th>
<th>Type Repair</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1954</td>
<td>McKay, et al.</td>
<td>transected</td>
<td>left</td>
<td>no</td>
<td>end-to-end</td>
<td>8 mos, good</td>
</tr>
<tr>
<td>1960</td>
<td>Borski &amp; Smith</td>
<td>bite</td>
<td>left</td>
<td>no</td>
<td>end-to-end</td>
<td>1 yr, good</td>
</tr>
<tr>
<td>1965</td>
<td>Sandoz &amp; Hodges</td>
<td>transected</td>
<td>right</td>
<td>vena cava</td>
<td>end-to-end</td>
<td>nephrectomy</td>
</tr>
<tr>
<td>1968</td>
<td>Moore &amp; Cohen</td>
<td>bite</td>
<td>left</td>
<td>iliac artery &amp; vein</td>
<td>splinted</td>
<td>2 mos, good</td>
</tr>
<tr>
<td>1969</td>
<td>Kern, et al.</td>
<td>bite</td>
<td>right</td>
<td>no</td>
<td>splinted</td>
<td>9 mos, good</td>
</tr>
<tr>
<td>1971</td>
<td>Gangai</td>
<td>bite</td>
<td>left</td>
<td>iliac vein</td>
<td>splinted</td>
<td>1 yr, good</td>
</tr>
</tbody>
</table>

a complete transection had occurred.3,5 Whenever there is major vascular injury, the ureteral injury may go unnoticed as in the case reported by Moore and Cohen.4 It is important, therefore, that once the vascular component of the injury has been repaired, the ipsilateral ureter be visualized and any damage to it recognized.

Repair of the ureteral injury is best accomplished by a splinting catheter when ureteral continuity has not been disrupted. Regeneration then occurs by bridging over the splinting catheter which is left in place for 4 weeks. Complete transection is repaired by end to end anastomosis over a splint with a wide spatulation of each end. Transureterostomy is a feasible alternative if end-to-end anastomosis would create too much tension.

Summary

The sixth case of ureteral injury following disc surgery has been reported and the mechanism of injury described. Early recognition of the ureteral damage means that repair can be accomplished with tissue that is not already the seat of dense inflammatory reaction from extravasated urine.

Addendum

Follow-up neurological examination of Case 2 on October 30, 1971, was normal. The patient had resumed skating. Plain films of the thoracic spine were unchanged from those of the immediate postoperative period.

References


Received for publication January 26, 1971.
Address reprint requests to: Mauro P. Gangai, M.D., Dept. of the Army, Urology Service, U. S. Army Tripler General Hospital, APO San Francisco 96438.