The Contents of Contractile Proteins in the Normal and Dilated Ureter

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YAMAGUCHI, O., IWATA, K., SUZUKI, M., ICHIKAWA, S. and KOBAYASHI, R. The Contents of Contractile Proteins in the Normal and Dilated Ureter. Tohoku J. exp. Med., 1983, 141 (1), 121-122 — Using an SDS-polyacrylamide gel electrophoresis, the contractile protein content of the normal rabbit ureter was compared with that of the dilated ureter. The relative amounts of the actin and myosin were significantly decreased in the dilated ureter. —— SDS-polyacrylamide gel electrophoresis; dilated ureter; peristaltic contraction; myosin; actin

The dilated ureter with poor peristaltic contraction still presents a difficult management problem, even after relief of the etiologic factor, such as ureteral obstruction or vesicoureteral reflux. Thus, the present paper demonstrates the relative amounts of the contractile proteins in normal and dilated ureters, which would provide further understanding of the functional capacity of the dilated, decompensated ureter.

The material was obtained from four rabbits with unilateral megaureter which we had experimentally induced. The ureteral tissue was homogenized and submitted to sodium dodecyl sulfate (SDS)-polyacrylamide gel electrophoresis. A photo-densitometry of the stained gels was performed to estimate the relative amounts of the contractile proteins (Tregear and Squire, 1973; Murphy et al. 1974).

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The results of electrophoresis showed that the actin and myosin (heavy chain) bands of the dilated ureter stained less intensely than those of the normal ureter (Fig. 1). The densitometry of the gel showed the same difference between the dilated and normal ureter. It is also demonstrated in Table 1 that the actin and myosin peak areas (S_A and S_M) of the dilated ureter are significantly smaller than those of the normal ureteral tissue. In addition, the ratio of myosin to actin (S_M/S_A) reduced significantly in the dilated ureter (Table 1). These results indicate that the relative amounts of the actin and myosin are decreased in the smooth muscle of the dilated ureter. Furthermore, the myosin is more decreased as compared with a reduction of the actin content.

### Table 1. Estimates of protein content by densitometry of the stained gels

<table>
<thead>
<tr>
<th>Ureteral tissue</th>
<th>S_A</th>
<th>S_M</th>
<th>S_M/S_A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>19.0±1.91</td>
<td>8.9±0.66</td>
<td>0.47±0.05</td>
</tr>
<tr>
<td>Dilated</td>
<td>12.1±2.59*</td>
<td>2.7±1.34†</td>
<td>0.22±0.09†</td>
</tr>
</tbody>
</table>

S_A, peak area of actin; S_M, peak area of myosin. Values are expressed as mean±s.d. for 4 preparations. *p<0.01, †p<0.005.

References