

## Constipation and the Urinary System

A major drawback in studying relationships between constipation and abnormalities of the urinary system has been the lack of a standard definition of constipation. In addition, a method of measurement of rectal abnormalities which could be correlated with the presence of constipation and which was recordable has only recently been available. The availability of rectal manometry has allowed for the assessment of rectal function in evaluation of constipation. We consider constipation to be present if one or more of the following criteria are present:

- More than 72 h interval between bowel movements.
- The presence of overflow fecal incontinence (encopresis or soiling).
- The passage of small hard scybalous stools with intermittent large stools.
- Incomplete rectal emptying as determined by rectal examination after defecation.
- Grossly decreased level of perception and increased tolerance to balloon insufflation in the presence of a normal rectoanal relaxation on rectal manometry, combined with any of the above elements.<sup>1-4</sup>

Rectal manometry allows the operator to determine the smallest rectal distention perceived by the patient, the volume at which relaxation of the internal sphincter occurs and the maximal volume that can be tolerated by the patient without discomfort or pain.<sup>1</sup>

This facilitates the diagnosis of constipation, especially as norms for manometry have already been established for children. The diagnosis of constipation is to be made by a physician with appropriate questioning on quantity and quality of stools and frequency of defecation, and physical examination. A simple question to the mother as to whether the child is constipated or not allows for a misdiagnosis to be made on the basis of arbitrary definitions. A convenient way of avoiding being misled is to obtain a written record of stool frequency and quality at follow up visits.

Similarly, the advent of techniques to assess urodynamics has led to the identification of non-inhibited contractions<sup>2</sup> of the bladder in patients with urinary tract infection, and on occasion enuresis and vesicoureteral reflux.

### Constipation and Urinary Obstruction

Prior to puberty the child's abdominal and pelvic cavities are one. As a result the close proximity of the rectum to the

posterior wall of the bladder is such that any gross distension of the rectum by stools has been reported to result in compression of the bladder, with bladder neck obstruction or distension of the urethra leading to urinary obstruction.<sup>3</sup>

### Constipation and Urinary Tract Infection

Leishman, in 1939, suggested that constipation did not play a role in urinary tract infection in adults.<sup>8</sup> In a series of 39 patients, Shopfner demonstrated, in 1968, that the presence of constipation has the potential for distorting the bladder wall and urethra.<sup>9</sup> Of the 39 patients, eight had reflux, 21 had enuresis and two had urinary tract infection. Campbell<sup>10</sup> described the lazy bladder syndrome as consisting of recurrent cystitis, urinary dribbling and constipation. Neumann *et al.*<sup>11</sup> in 1973, noted the presence of constipation in children who presented with anomalies ranging from recurrent urinary tract infection to mild or severe vesicoureteral reflux. Constipation was diagnosed on the basis of a history of infrequent bowel motions and the radiologic evidence of accumulated feces. Aggressive treatment of constipation resulted in resolution of soiling, with proven rectal reservoirs of feces as determined by rectal examination and rectal manometry. It is essential therefore that a written record of stool frequency and quality be kept so that parents recognize the presence of constipation. This then facilitates compliance with appropriate therapy.

An increased incidence of bacteriuria occurs in rats in whom fecal retention is surgically induced.<sup>17</sup>

### Constipation and Enuresis

The etiology of enuresis is not completely understood. In 17 constipated enuretics who had uninhibited detrusor contractions, treatment of coexisting constipation resulted in the cessation or improvement of enuresis in 15 and two cases respectively.<sup>18</sup>

As previously stated, Shopfner, in discussing urinary tract pathology associated with constipation, also noted that 54% of these patients were enuretic.<sup>9</sup> Baumann and Hinman<sup>19</sup> discussed the treatment of incontinence with non-obstructive disease of the urinary tract. Their 73 male patients had enuresis with encopresis. Though the emphasis was on hypnotherapy as specific treatment of enuresis, they did note that aggressive treatment of constipation, commonly including digital evacu-

ation of the rectum, was required before cessation of enuresis, suggesting that constipation may have been a relevant element causing enuresis. Urodynamics in patients who were severely constipated but did not have urinary symptoms showed uninhibited bladder contractions.<sup>18</sup> This suggests that constipation may induce uninhibited bladder contractions, with consequent enuresis.

### Constipation and Vesicoureteral Reflux

Dilatation of the urinary tract, including the bladder, has been noted by numerous authors to occur in association with Hirschsprung's disease.<sup>20,21</sup> Successful treatment of this disease may result in resolution of the vesicoureteral reflux.<sup>22</sup> Kottmeier and Clatworthy noted a higher incidence of vesicoureteral reflux in children with severe functional constipation than in those with Hirschsprung's disease.<sup>23</sup> Also, constipation may cause ureteral dilatation with hydronephrosis and, when relieved, may allow for resolution of urinary tract dilatation.<sup>24</sup> Ochoa and Gorlin have described a syndrome of distortion of facial expression associated with urinary tract dilatation.<sup>25</sup> In two-thirds of afflicted patients moderate to severe constipation was present. Whether the constipation is a primary motility problem contributing to urinary tract dilatation or is secondary to chronic dehydration due to renal failure associated polyuria was not determined. Abnormal large bowel motility has been noted in patients with vesicoureteral reflux.<sup>26,27</sup>

We have noted the presence of constipation in children with primary vesicoureteral reflux.<sup>28</sup> Although a control study was not done, rapid resolution of reflux occurred with aggressive treatment of constipation in the absence of antibiotic or anticholinergic therapy for treatment of associated uninhibited bladder contractions. White also noted that resolution of infection with reflux was more easily attained when associated constipation was aggressively treated.<sup>29</sup> Hinman<sup>30</sup> observed that the constipated child may have an evolution of encopresis to enuresis to urinary tract infection to vesicoureteral reflux. Studies by Bailey *et al.*<sup>31</sup> noted a 55% incidence of abnormal anal sphincter electromyograms in children with enuresis and urinary tract infection, suggesting the possibility that abnormalities of the rectum may cause enuresis and urinary tract infection and reflux in children. Indeed the observation that children with functional constipation may have uninhibited contractions of the bladder in the absence of urinary symptoms strongly supports this possibility.

Because the external anal sphincter and the urethral sphincter together with the perineal musculature may be considered to be a single physiologic unit, with voluntary anal contraction consequent concomitant urethral sphincter contraction occurs. It is possible that the urethral sphincter contraction may be responsible for a dyssynergic voiding pattern with secondary bladder instability, enuresis, urinary tract infection or vesicoureteral reflux.

Since the rectum may be dilated for months to years in association with chronic constipation, one-time emptying of the rectal ampulla will result in a momentarily empty but still

dilated rectum, without resolution of constipation. Oral therapy alone directed to the maintenance of an empty rectum is not consistently successful; the maintenance of an empty rectum is only achieved by repeated use of enemas. A satisfactory approach is the use of daily saline enemas (5 ml of salt in 1 liter of warm water). Using an enema bag held approximately 0.5 m above the patient maintained in a proper position, an adequate volume will be infused under gravity with minimal induction of cramps.

Although the frequency of enemas will be decreased progressively, treatment of constipation should be continued until rectal tone returns to normal. This usually takes at least 3 months.

### Summary

The morbidity associated with enuresis, urinary tract infection and vesicoureteral reflux is exceedingly high. Constipation is a condition easily amenable to resolution with appropriate therapy. Consequently, in the management of children with any of these conditions, appropriate investigation should be performed to determine the presence of constipation. Should constipation be present, therapy should be instituted so that it may aid in the resolution of the urinary symptoms.

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