

## Rectal suppository: commonsense and mode of insertion

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Rectal suppository is a well-known form of medication and its use is increasing. The commonest shape is one with an apex (pointed end) tapering to a base (blunt end). Because of a general lack of information about mode of insertion, we asked 360 lay subjects (Egyptians and non-Egyptians) and 260 medical personnel (physicians, pharmacists, and nurses) by questionnaire which end they inserted foremost. Apart from 2 individuals, all subjects suggested insertion with the apex foremost. Commonsense was the most frequent basis for this practice (86.9% of lay subjects and 84.6% of medical personnel) followed by information from a relative, a friend, or medical personnel, or from study at medical school. **Suppository insertion with the base or apex foremost was compared in 100 subjects (60 adults, 40 infants and children). Retention with the former method was more easily achieved in 98% of the cases, with no need to introduce a finger in the anal canal (1% vs 83%), and lower expulsion rate (0% vs 3%).** The designer of the "torpedo-shaped" suppository suggested its insertion with apex foremost. **Our data suggest that a suppository is better inserted with the base foremost.** Reversed vermicular contractions or pressure gradient of the anal canal might press it inwards.

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### Introduction

Suppositories are conveniently shaped medicated solid masses intended for insertion into one of the body orifices other than the mouth. Despite the early use of this form of medication, suppositories were not popular until the late nineteenth century, and their use was not confined to the rectum but extended to the treatment of disorders of the bladder, vagina, and urethra. However, the term suppository without further distinction is usually reserved for those intended to be introduced into the rectum.<sup>1,2</sup>

Rectal suppositories vary in weight (those for adults are about 2 g, whereas those for infants and children are proportionately smaller) and shape (cone shaped with rounded apex, bullet shaped, or torpedo shaped.<sup>3</sup> Nowadays, almost all suppositories are marketed in the torpedo shape (fig 1), which was proposed by Henry S. Wellcome about a century ago. He suggested that the suppository should be inserted with the thick bulbous head foremost so that when the anal sphincter contracts, expulsion is prevented and the suppository is held in position as the entire muscle force acts to retain and press inwards.<sup>4</sup> Although most pharmaceutical textbooks agree that the torpedo-shaped suppository is the best form, none has mentioned frankly with which end a suppository should

be inserted foremost.<sup>1,3,5,6</sup> However, there is an implication in some of these books that the suppository should be inserted with the narrow blunt end foremost.<sup>1,3</sup>

We have examined the mode of suppository insertion in practice and whether it is better done with the apex or base foremost.

### Subjects and methods

620 men and women of various age groups and educational levels were included in the study. 560 subjects were Egyptian, of whom 300 were lay subjects, 150 physicians, 70 nurses, and 40 pharmacists. The remaining 60 subjects came from developed countries (Western Europe, USA, and Canada). All subjects were asked by questionnaire about previous use of suppositories (personal use or insertion in another individual), mode of suppository insertion (**apex or base foremost**), and source of this information. Additionally, medical personnel were asked whether they usually explain the mode of insertion to the patient.

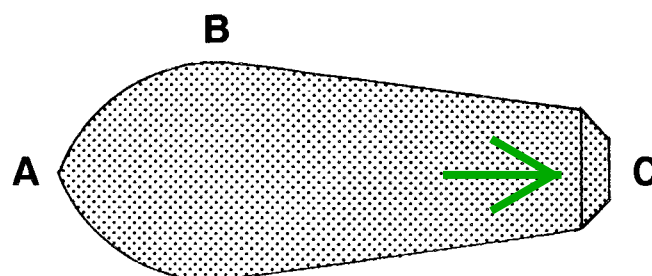


Fig 1—Torpedo-shaped rectal suppository.

A, apex (pointed end); B, greatest diameter; C, base (blunt end). A-B to B-C = 1:3.

Different medications in rectal suppository form were prescribed for various medical reasons for 100 of the 300 lay Egyptians (for personal use in 60 adults, for 40 infants and children of the other 40 adults). All 100 subjects had previously used suppositories, and had inserted them apex foremost. They were instructed to introduce the first dose with the apex foremost, as they routinely did, and the second dose with the base foremost. Adults for whom suppositories were prescribed were instructed to relax, to introduce the suppository till the finger touched the anal verge, and then to contract the muscles of the anal region or make a maximum effort to indraw the anus. Because infants and children often do not cooperate, parents were instructed to insert the suppository as they would usually do so. The nature of the experiment was not explained to the subjects and the given reasoning at first interview for the two modes of insertion was the claim that a suppository can be inserted both ways and that everyone should try to find the way that suits him best. At the second interview, subjects were asked by questionnaire about ease at start of insertion and ease of retention (similar or different), the need to insert the finger in the anal canal to push the suppository, and its expulsion after insertion. The rest of

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TABLE I—USE OF RECTAL SUPPOSITORY

|                                       | Lay subjects        |                        | Medical personnel    |                 |                      |                  |
|---------------------------------------|---------------------|------------------------|----------------------|-----------------|----------------------|------------------|
|                                       | Egyptian<br>(n=300) | Non-Egyptian<br>(n=60) | Physician<br>(n=150) | Nurse<br>(n=70) | Pharmacist<br>(n=40) | Total<br>(n=260) |
| Previous use                          | 280 (93.3)          | 55 (91.6)              | 121 (80.7)           | 70 (100)        | 35 (87.5)            | 226 (86.9)       |
| Insert apex foremost                  | 299 (99.7)          | 59 (98.3)              | 150 (100)            | 70 (100)        | 40 (100)             | 260 (100)        |
| Source of information                 |                     |                        |                      |                 |                      |                  |
| Commonsense                           | 258 (86)            | 53 (88.3)              | 127 (84.7)           | 59 (84.3)       | 34 (85)              | 220 (84.6)       |
| Personal contact*                     | 27 (9)              | 5 (8.3)                | 23 (15.3)            | 8 (11.4)        | 5 (12.5)             | 36 (13.8)        |
| Medical personnel                     | 14 (4.7)            | 1 (1.7)                | NA                   | NA              | NA                   | NA               |
| Medical school                        | NA                  | NA                     | 0                    | 3 (4.3)         | 1 (2.5)              | 4 (1.5)          |
| Describe mode of insertion to patient |                     |                        |                      |                 |                      |                  |
| Yes                                   | NA                  | NA                     | 11 (7.3)             | 8 (11.4)        | 2 (5)                | 21 (8.1)         |
| No                                    | NA                  | NA                     | 139 (92.7)           | 62 (88.6)       | 38 (95)              | 239 (91.9)       |

Data are no of subjects (%), NA = not applicable

\*Information from friend or relative.

the questionnaire, about the source of the subjects' information, was completed and the nature of the experiment was explained.

## Results

Table I shows that most of the lay subjects had used a suppository personally or had inserted one into another individual. Apart from 2 individuals, all subjects inserted the suppository with the apex foremost. This practice was based on commonsense (insertion in this way being easier and less likely to be traumatising), information from a relative, a friend, or medical personnel (for lay subjects), or knowledge from medical school (for medical personnel). Commonsense was the reason for mode of use in most subjects. 3 lay Egyptian subjects reported the advice of the physician to lie on their sides in bed for a while after insertion of the suppository to promote retention and prevent its expulsion. 1 lay non-Egyptian subject, had been instructed by a physician to push the suppository in with an ear swab. The lay subjects who inserted the suppository with the narrow base foremost were an Egyptian man who found by chance that this way was easier, and a German woman who obtained this information from her father (a physician). Only 8.1% of the interviewed medical personnel described to the patients that the mode of suppository insertion should be apex foremost.

All adults, instructed to introduce the suppository in both ways, found similar difficulty at the start of insertion. In 98% of the cases (59 of 60 adults and 39 of 40 infants and children), retention was more easily achieved when the base was inserted foremost with no need to introduce the finger in the anal canal to push it (table II). On the other hand, this manoeuvre was necessary for insertion with the apex in 86.7% of the adults and 77.5% of the infants and children. Most of the other adults claimed that on personal use with the base of the suppository inserted foremost and

contraction of the anal muscles after insertion, the subject had the sensation that the suppository slipped upwards along the anal canal, being sucked, until it could no longer be felt. Only three incidents of expulsion occurred, all after the apex had been inserted foremost.

## Discussion

Rectal suppository is a common form of medication; more than 90% of the population included in our study had used one personally or inserted one in another individual. In addition to the numerous advantages of such treatment, suppositories do not require special equipment or techniques of administration and the patient can administer the dose to himself. Thus, the list of drugs administered via this route is expanding.<sup>5,7-14</sup>

The principal drawback of suppository use is the aesthetic objection to introducing a solid mass into a body cavity. Some of our subjects were even embarrassed to admit personal use of suppositories. Our findings suggest that the

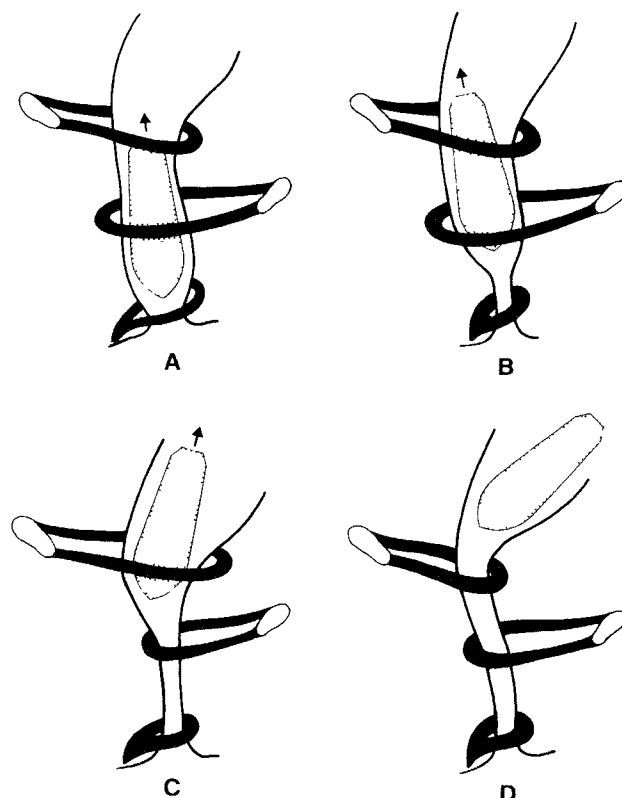


Fig 2—Reversed vermicular contractions of the external anal sphincter.

A, suppository lies within relaxed external sphincter, B, base loop contraction and intermediate loop relaxation; C, intermediate loop contraction and top loop relaxation; D, top loop contraction

TABLE II—COMPARISON OF RECTAL SUPPOSITORY INSERTION

| Subjects                     | Mode of insertion |               |
|------------------------------|-------------------|---------------|
|                              | Apex foremost     | Base foremost |
| <b>Adults</b>                |                   |               |
| Number                       | 60                | 60            |
| Easier method (%)            | 0                 | 59 (98.3)*    |
| Need to introduce finger (%) | 52 (86.7)         | 1 (1.7)       |
| Expulsion (%)                | 2 (3.4)           | 0             |
| <b>Infants/children</b>      |                   |               |
| Number                       | 40                | 40            |
| Easier method (%)            | 0                 | 39 (97.5)*    |
| Need to introduce finger (%) | 31 (77.5)         | 0             |
| Expulsion (%)                | 1 (2.5)           | 0             |

\*No difference between either method in 1 subject.

suppository should be inserted with its base rather than apex foremost. When the apex is introduced foremost, the squeezing action of the anal sphincter cannot drive the suppository into the rectum; this leads to anal irritation with subsequent expulsion. Alternatively, the suppository may be pushed into the rectum by insertion of the finger for a short distance into the anal canal, a practice that may add to the aesthetic objection by the patient and can be avoided if the base is introduced foremost. Furthermore, instructions to help retention in position by crossing the legs or lying on the side<sup>6</sup> would be unnecessary.

Despite numerous studies on the physiology of the anal canal for the maintenance of continence,<sup>15-22</sup> to our knowledge there are no previous publications that have correlated physiology with suppository insertion. The lower part of the external sphincter usually lies farther downwards and outwards relative to the anus.<sup>21</sup> When a suppository is fully inserted with the apex foremost, the circular base distends the anus, and the lower edge of the contracting external sphincter fails to provide a tight closure of the orifice.<sup>21</sup> A suppository for an adult is about 3.2 cm in length; the thickest part, about 2.4 cm from the base,<sup>5</sup> lies in or just proximal to the high-pressure zone in the anal canal.<sup>15-21</sup> Thus, contraction of the sphincter holds the suppository in position, obviating the possibility of expulsion. Contrary to Henry Wellcome's claim,<sup>4</sup> the suppository is not pressed inward but is stuck in position, unless it is pushed by the introduction of the finger for a short distance into the anal canal. By contrast, when the base is foremost, the lower edge of the contracting external sphincter, facing the pointed apex, can provide a tight closure of the anus. The suppository may then slip upwards by reversed "vermicular contractions" (fig 2), which is the reverse of the process suggested for dispelling the last faecal portion from the anal canal.<sup>22</sup> Nonetheless, when suppositories were inserted in this way in infants and children (who regularly do not cooperate and contract the anal muscles on any attempt of insertion) there were no difficulties. The presence of a pressure gradient in the anal canal, with pressure rising to a maximum proximal to the anal verge,<sup>15-21</sup> might provide an explanation and might even be the underlying mechanism in all cases.

That the suppository was found to be inserted with the apex foremost by almost all of the subjects in our study, irrespective of age, sex, educational status, or nationality mirrors the attitude of the medical profession since all the interviewed medical personnel behaved similarly, with a minority describing this mode of insertion to patients. It is difficult to understand why the mode of suppository insertion has not been revised for almost a century, in view of recent knowledge on anal sphincter function.<sup>15-22</sup> It seems that commonsense is not always appropriate.

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## From The Lancet

### Syme in motion

Amongst the pleasant and thriving medical societies of London is now to be reckoned the Edinburgh University Club. The conditions of membership—always assuming the principal one, that of being a graduate of Edinburgh—being easy, and the great duty (that of dining frequently with one's academical associates) being eminently a pleasure, it is not to be wondered at that nearly three hundred graduates have joined this Club. This pleasure, always enhanced when some veteran of the school is in the chair, was well-nigh complete when the Club dined at St James's Hall under the presidency of the Professor of Clinical Surgery. For it is a most creditable peculiarity of Mr Syme to enjoy in a very high degree the esteem, we had almost said the affection, of his pupils, who now represent two generations. This remark may scarcely be intelligible to those who are only familiar with the polemical aspects of Mr Syme's character, but it will be quite understood and endorsed by the members of the Club. It was refreshing to them to see him, after a lapse of time, so exactly like what he was when they knew him as students, and listened to his pointed practical wisdom. He had scarcely proposed "The Queen", which he did in a sentence of his own acute Saxon, when all the style of the man flashed upon them as if only yesterday they had been his pupils, and sat silent before him, as students do before men of few words and many thoughts, and watched him as he rubbed his knees and his face brightened up with smiles as he looked on a good case (they were all good cases) of excised elbow-joint or amputation at the ankle. Few men have more intense individuality than Mr Syme.

(May 26, 1866)