



## Self-dilation for refractory oesophageal strictures: an Auckland City Hospital study

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### Abstract

**Aim** To determine the demographics, indications and long-term outcomes of patients using self-dilators for refractory oesophageal strictures.

**Methods** Patients with oesophageal strictures who performed self-dilation were analysed retrospectively. Patients who were still alive were also interviewed via telephone.

**Results** A total of 8 patients were analysed and 2 patients had since died. Most patients were in the 20–29 age group (n=4) when they first attempted self-dilation. The most common cause for oesophageal strictures was ingestion of corrosive (n=5). Each patient underwent on average 20 endoscopies (including endoscopic dilations) before attempting self-dilations. 1 patient developed oesophageal perforation during endoscopic dilation. 3 patients were still using self-dilators at the time of analysis. All the patients were only using lubricants (K-Y jelly) and none required topical anaesthetic such as Xylocaine throat spray.

**Conclusions** Oesophageal self-dilators were well-tolerated and complications were rare. By reducing the need for endoscopies, they are potentially cost-effective. However, patients must receive proper education before they are able to administer this treatment with confidence.

Patients with refractory oesophageal strictures who require regular dilations can be managed in the community with long-term self-dilation programmes<sup>1</sup>. The efficacy of self-dilation in patients within the Auckland region has yet to be analysed. We present the demographics, indications and long-term outcomes of patients using self-dilators for refractory oesophageal strictures.

### Methods

This is a retrospective study of all patients who performed self-dilation for oesophageal strictures between 1996 and 2007 who were managed at the Gastroenterology Department of Auckland City Hospital. Patients were identified from the Endoscribe™ software and also from the investigator's database. Surviving patients were followed-up via telephone with a questionnaire. The questions asked in the questionnaire were

1. "Are you still using self-dilators?"
2. "If yes, how often are you using self-dilators?"
3. "If not, when did you stop and how often had you been using them?"
4. "What sort of difficulty, if any, did you experience while using self-dilators?"

We define an oesophageal stricture as an anatomic restriction due to cicatricial luminal compromise or fibrosis that results in the clinical symptom of dysphagia without endoscopic evidence of inflammation<sup>2</sup>. A stricture is considered refractory by some authors if there is failure to remediate the anatomic problem to a diameter of 42 French over 5 sessions at 2-week intervals<sup>2</sup>.

In practice, however, we did not strictly adhere to this - strictures were considered refractory in our department if endoscopic dilatations were required once a week. With refractory oesophageal strictures our aim was to dilate to 51–54 French via endoscopy and then to proceed to self-dilation at 48–51 French using Maloney dilators. There was no set criteria when to consider self-dilation. In general, patients still needing endoscopic dilations after 3 months would be considered candidates for self-dilation.

After a series of endoscopic dilations, the first self-dilation attempt would be made on the same day immediately after an endoscopic dilation under conscious sedation with midazolam (0.5–1mg) and fentanyl (50–75 mcg). The patients would then have supervised self-dilations for the next 6 days without sedation. Local anaesthetic throat spray was often used for the first 1-2 self-dilation attempts only. They would proceed to self-dilation at home when the nurses were satisfied with their safety and competence.

## Results

A total of eight patients were identified using self-dilators during this study period. Two patients had since died.

Most patients were in the 20–29 age group (n=4) when they first attempted self-dilation. Two patients were in the 40–49 age group and another two were in the 70–79 age group.

Five of the eight patients were males. Four patients were from the Auckland District Health Board, two from Counties-Manukau District Health Board, one from Waitemata District Health Board and one from Northland District Health Board.

With regards to the aetiology of strictures, the most common cause was ingestion of corrosive (n=5) followed by mucosal irritation from long-term nasogastric tube placement (n=2) and radiotherapy-induced fibrosis (n=1).

On average, each patient underwent 20 endoscopies (including endoscopic dilations) before attempting self-dilations. The number of endoscopies performed for each patient ranged from 7 to 39.

The highest number performed before self-dilation was attempted was on one patient who had 39 gastroscopies for a severe stricture involving the upper to lower mid oesophagus. The least number of endoscopies performed prior to self-dilation was seven and this patient only had mild narrowing with a length of 1cm on initial endoscopy. Other patients had at least moderate strictures. There appeared to be a correlation between the severity of the strictures and the number of endoscopic dilations needed.

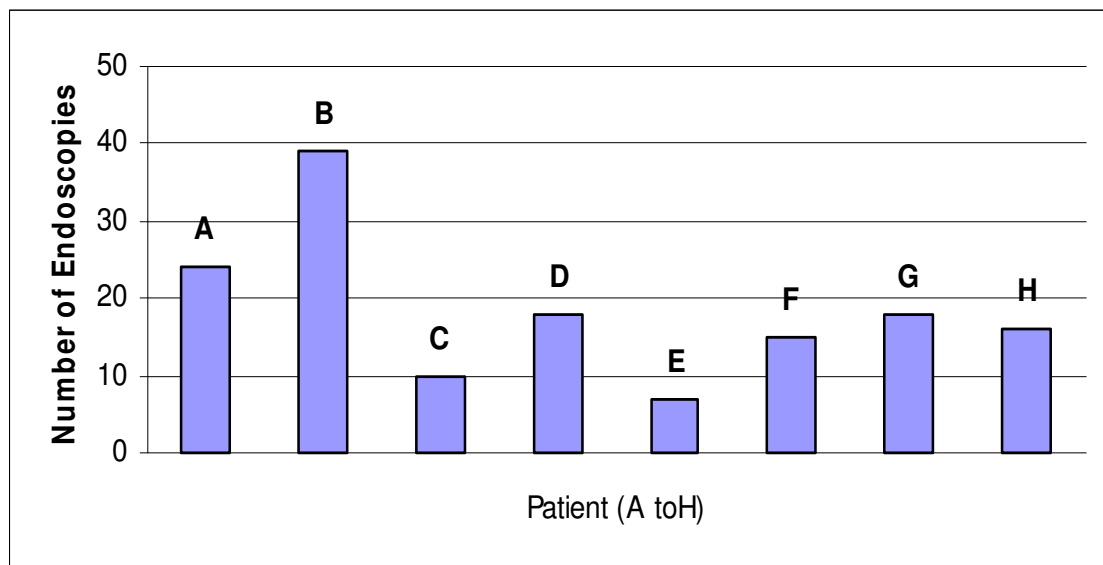
Only one patient developed oesophageal perforation but this happened during endoscopic dilation. This was the same patient who underwent the highest number of gastroscopies in this study. Nevertheless, he was able to perform self-dilation without further complications. There were no other complications reported amongst other patients. One patient died of bowel obstruction from colorectal cancer and the death was not directly related to oesophageal dilation. Another patient died from indeterminate causes.

At the time of this analysis in January 2008, there were six surviving patients. One patient was lost to follow-up. Of the remaining five patients that could be contacted, the average duration of continuous usage of self-dilation was 48.6 months (range 5 months to 82 months). Three patients were still using self-dilators.

The frequency of usage was from 3–4 times a week in two patients, once a week in two patients and approximately 1–2 times a year in one patient “as required”.

Three of the patients reported no difficulties inserting the self-dilators. One patient described psychological hesitancy in using the device, stating that it felt “unnatural” but there was no actual physical impediment to using the dilator. Another patient who had radiotherapy-induced oesophageal stricture complained of difficulty passing the dilator down far enough and was experiencing nausea and early satiety after using the instrument. This patient had only started using self-dilators in August 2007 and this was the most recent commencement of use among all the patients.

**Figure 1. Number of previous endoscopies prior to self dilatation**



All the patients were only using lubricants (K-Y jelly) and none required topical anaesthetic such as Xylocaine throat spray.

To date, none of the patients had surgical interventions for their oesophageal strictures.

## Discussion

This study has shown that oesophageal self-dilators were remarkably well-tolerated and complications rarely occurred. The single patient who developed oesophageal perforation while having endoscopic dilatation had no further complications while using self-dilators. With practice, patients reported easy passage of the instrument and none reported local pain even without the use of topical analgesics.

Maloney dilators accomplish their result from the radial push transmitted to the stricture by the tapered portion of the tube as it passes through the narrowed area.<sup>3</sup> Most patients obtain relief after dilation, but, as a case series demonstrates, 63% will develop recurrent dysphagia requiring repeat dilation.<sup>4</sup>

Uncomplicated strictures can be effectively dilated with blind passage of progressively larger Maloney dilators under the guidance of the 'rule of three' which states that no more than three successively larger dilator should be passed after initial resistance is met.<sup>5</sup>

The complications of dilation range from bleeding and perforation to bacteraemia, of which bacteraemia is thought to be the most common complication but is of little clinical significance.<sup>6</sup> Perforation of the oesophagus is the most feared complication but the incidence is low, approximating 0.3% to 0.5% per procedure,<sup>7</sup> and correlates directly with more complex strictures.<sup>8</sup>

The safety of self-dilators among patients is reflected in another study which analysed 51 patients with corrosive oesophageal strictures.<sup>1</sup> Of the 51 patients, 6 (11.8%) developed mediastinitis with initial endoscopic dilatation but no complication occurred when they commenced self-dilation.

The most common cause for oesophageal strictures in our study was corrosive ingestion. In one study of 239 patients who ingested corrosives, 65% of patients went on to develop oesophageal stenosis of which 59.3% were classified as moderate and 23% were severe.<sup>9</sup> Less common causes for oesophageal strictures as highlighted in our study are mucosal irritation from nasogastric tubes and radiotherapy-induced fibrosis.

Oesophageal stents are an option to treat oesophageal strictures but we have not used them in this setting. Self-expanding metal stents are not suitable for benign strictures as they are difficult to remove after placement due to embedment into the oesophageal wall.<sup>10</sup> In addition, they are associated with significant morbidity including stent migration, recurrent strictures, fistula formation, bleeding and death.<sup>11</sup> These stents are not FDA-approved for benign strictures.<sup>12</sup>

More recently, retrievable stents have been used for benign oesophageal strictures but they were also limited by stent migration, this being the most common complication, occurring 27% (range 7–57%) of the time in a meta-analysis.<sup>13</sup>

Self-dilation is cost-beneficial as it reduces the need for endoscopies and hospitalization. The reimbursement for a single gastroscopy session at Auckland City Hospital is \$814.48 while an oesophageal dilator costs \$500.00 and this can be re-used by the patient.

It is also safer as no sedation is required. It can be administered at anytime and this gives patients greater autonomy. Nevertheless, proper education must be given to patients before they can administer this therapy with confidence. The role of nurses is important in this regard in providing training, reassurance and support.

**Competing interests:** None.

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