

Perception of esophageal manometry

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SUMMARY. Esophageal manometry is an important investigation method but its direct impact on patients' well-being has not been studied. A structured questionnaire was given to all patients ($n = 92$) after the manometry during one calendar year. The response rate was 91%. A total of seventy-one patients also reported their health status during the next 24 h. No serious side-effects were recorded. About half of the respondents regarded manometry as an easy or fairly easy investigation. The most common problems were irritation of nose and throat. In total, 48% of the respondents had mild to moderate late symptoms after manometry, usually soreness of the throat or nose lasting for some hours. The manometry was more troublesome to women than to men. It is concluded that esophageal manometry is generally a benign and fairly tolerated investigation, and the high level of anxiety that many patients show before the manometry is not well justified.

INTRODUCTION

Manometry is the best generally available method to study motor disorders of the esophagus.¹ The American Gastroenterological Association² regards manometry indicated to establish the diagnosis of achalasia, diffuse esophageal spasm, and motor abnormalities associated with systemic (e.g. connective tissue) diseases. Manometric techniques are also useful for accurate placement of pH probes. Otherwise, the position of manometry in preoperative evaluation for antireflux surgery is still controversial.^{2,3} Manometry includes catheterization of sensitive tissues like those of the nose and pharynx, and the procedure, however, is inevitably more or less unpleasant for the patient. A prospective inquiry was organized to assess the spectrum and the amount of discomfort related to esophageal manometry.

MATERIALS AND METHODS

All 92 patients studied in the North Karelia Central Hospital with esophageal manometry during the year 1999 were included in the study. A total of 50 patients (54%) were men and 42 patients (46%) were women.

The median age of the patients was 50 years and the age range was 24–78 years. All patients had gone through upper gastrointestinal endoscopy at least once before the manometry. Indications for esophageal manometry are shown in Table 1.

Manometry was always performed by the author, assisted by one of the four specially trained nurses or medical laboratory technicians. A standard computer-assisted water perfusion equipment (Polygram 2.04, Synectics Medical Ab, Stockholm, Sweden) was used. A semi-flexible plastic catheter with a diameter of 4 mm was introduced through either nostril into the pharynx and further, with the help of frequent water sips, through the esophagus into the ventricle. At first, the lower esophageal sphincter was studied with the slow pull-through technique using 0.5-cm steps with a pause of 20–30 s. Relaxation of this sphincter was tested with several 'wet' swallows by applying 5 mL of water into the mouth from a 50-mL syringe. Next, the pressure profile and length of the lower esophageal sphincter was measured two or three times with the continuous pull-through technique, using a constant (manual) catheter speed of 1 cm/s during a 10-s breath-holding. The tip of the four-channel catheter was then placed 5 cm above the oral border of the lower esophageal sphincter to study motor function of the esophageal body, with 10–20 wet swallows. Last, the pressure and relaxations of the upper esophageal sphincter were studied with a semi-rapid pull-through technique using,

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Table 1. Indications for esophageal manometry in North Karelia Central Hospital in 1999 ($n = 92$)

Indication	<i>n</i>	%
Preoperative evaluation for antireflux surgery	50	54
Gastroesophageal reflux disease	24	26
Dysphagia	13	14
Chest pain	3	3
Abdominal pain	1	1
Belching	1	1

again, 0.5-cm steps but usually only 5–10 s pauses between catheter moves. The time interval between insertion and removal of the catheter was usually about 30 min but it could be extended to 1 hour or more in some difficult cases with extreme anxiety, sensitive throat, and/or poor co-ordination of the swallows.

After the manometry, the physician registered his view of the catheterization and the success of measurements. All studies were diagnostically adequate and no marked complications requiring hospitalization or other interventions occurred. Patients were asked to observe their health 24 h after the manometry, and then to fill in and post an inquiry form. The observation time was not further extended in fear that it may have resulted in a much lower response rate. The 10 patients (12%) who immediately entered 24 h esophageal pH probing naturally only registered feelings during the manometry.

The questionnaire included a general estimate of esophageal manometry. After that, patients should name the single most disturbing factor or symptom in the manometry.

The nature of late (0–24 h) symptoms were enquired either from a list of suggestions or spontaneously. Duration (with an accuracy of 1 h) and severity of these symptoms were registered.

In total, 84 patients (91%) returned the questionnaire; 44 (52%) of them were men and 40 (48%) of them were women. The median age of the patients was 49 years and the age range was 24–75 years. Except for one patient, all were first-timers in esophageal manometry.

The grade of subjective patient discomfort and late symptoms in esophageal manometry was compared with the physician's estimation of technical difficulty of the procedure using Kruskal–Wallis non-parametric one-way analysis of variance. The effect of gender to the perception of manometry was analyzed by the Mann–Whitney *U*-test. A *P*-value of < 0.05 was considered as significant.

RESULTS

The physician's estimate of the nasogastric catheterization is presented in Table 2; only patients who returned questionnaires are included. The problems

Table 2. Physician's view of the nasogastric catheterization ($n = 84$)

Quality	<i>n</i>	%
Easy	36	43
Fairly easy	33	39
Moderately difficult	13	15
Difficult	2	2
Extremely difficult	0	0

Table 3. Physician's view of the difficulties (if any) in the measurement phase of esophageal manometry ($n = 29$)

Difficulty	<i>n</i>	%
Lack of co-ordination ^a	20	69
Cough	4	14
Hyperventilation	2	7
Restlessness	2	7
Excretion of mucus	1	3

^aUsually regarding timing of swallows or breath-holding.

Table 4. General estimate in esophageal manometry

Grade	<i>n</i>	%
No discomfort	15	18
Slight discomfort	25	30
Moderate discomfort	34	40
Marked discomfort	9	11
Extreme discomfort	1	1

The number of patients who expressed their views was 84.

Table 5. The most unpleasant factor in esophageal manometry ($n = 84$)

Factor	<i>n</i>	%
Swallowing the catheter	36	43
Irritation of the nose	23	27
Irritation of the throat	13	15
Following the instructions	6	7
Cough	3	4
Irritation of the stomach	2	2
Staying still	1	1

arose almost exclusively from swallowing the catheter (54%) or penetrating the nose (42%). The measurement was uneventful in 55 cases (65%), slight difficulties were registered in 21 patients (25%), and moderate difficulties were registered in eight (10%) investigations. Table 3 shows the quality of significant difficulties during manometry measurements. The patients' opinions regarding the total amount of discomfort in esophageal manometry are presented in Table 4. Swallowing the catheter was the single most disturbing phase during the manometry (Table 5). Some patients suggested a wider examination bed, relaxing music, or a fresco.

A total of 71 patients (85% of all respondents) answered the late-symptom section of the questionnaire. Out of these, 34 (48%) had (on the average three, maximally seven) late symptoms with a mean duration of 8 hours. The total number of the late

symptoms lasting for at least the whole 24 h was 14 (in nine patients) but as far as is known, none of the patients actually sought medical help. The maximum number of the long-lasting (24 h or more) late symptoms in one single patient was four. The subjective severity of late symptoms is presented in Table 6. Sore throat was the most common late symptom, and it usually subsided before bedtime (Table 7). Some single patients also reported headache, backache, pain 'in the diaphragm', and meteorismus. One patient complained of a light nosebleed lasting for more than 12 h.

The physician's estimate regarding easiness of the catheterization correlated positively with the patients' views of the comfort of esophageal manometry as a whole ($P = 0.016$). On the other hand, the physician's estimate regarding difficulties in the measurement phase correlated positively with the patients' views of the occurrence of (usually mild) late symptoms following esophageal manometry ($P = 0.017$).

Women reported esophageal manometry to be more unpleasant than males did ($P = 0.030$). Only 33% of women regarded manometry as 'easy' or 'fairly easy', whereas the respective figure in men was 61%. Women also regarded the late symptoms following esophageal manometry more disturbing than men ($P = 0.005$). In total, 33% of women, and 67% of men had no late symptoms.

DISCUSSION

As known from experience, many patients enter esophageal manometry very anxiously, even with a

sense of fear. This easily causes a vicious circle. The most difficult part of the investigation, swallowing of the catheter, requires, besides, careful touch and timing of an experienced physician, natural function of the pharynx. Anxiety often turns swallowing to the opposite movement, i.e. ejection, and the failure and enhanced irritation tend to increase the patient's stress even further. The success of esophageal manometry is best guaranteed by a firm and encouraging attitude of the investigation team. The patient is undoubtedly more relaxed if the course and possible difficulties of the study are explained to the patient beforehand, preferably by the referring personnel.

It is no surprise that most of the complaints were focused on the nose and throat. The esophagus and stomach are more distensible and, as visceral organs, are much less sensitive to mechanical irritation. It should be clearly explained to the patient that sore throat especially is a common and relatively long-lasting, although benign, symptom after esophageal manometry. It is assumed that the relatively frequent abdominal pain is linked more to the preoperative fast and aerophagia during the operation than the mechanical manipulation of the stomach. Chest pain was a unexpectedly common late symptom considering that none complained of it during, or right after, the manometry. Furthermore, none patient sought medical attention for this symptom. Chest pain was, thus, in most cases probably linked to such factors as in- and postoperative acid exposure of the esophagus; 80% of the patients had a verified or suspected gastroesophageal reflux disease, and discontinuance of acid-suppressing medication was common and not due to actual myocardial ischemia.

The finding that the female gender has more problems in gastric catheterization is in accordance with the report of Mulcahy *et al.*⁴ In upper gastrointestinal endoscopy, women requested intravenous sedation more often than men, although there was no significant difference in the unpleasantness of the intubation between the sexes.⁴ Mulchany *et al.*⁴ were not interested on postoperative symptoms.

It should be stressed that esophageal manometry, although invasive, is a safe procedure in experienced

Table 6. Subjective severity of 'late' symptoms after esophageal manometry ($n = 71$)

Symptoms	<i>n</i>	%
None	37	52
Very mild	9	13
Mild	16	23
Moderate	8	11
Severe or very severe	0	0
Unspecified	1	1

Table 7. Nature, subjective severity, and duration of the reported 'late' symptoms after esophageal manometry

Symptom	Total number		Moderate or severe symptom		Median duration of the symptom (h)
	<i>n</i>	% ^a	<i>n</i>	% ^b	
Sore throat	28	39	14	50	9
Sore nose	20	28	5	25	4
Abdominal pain	17	24	8	47	4
Chest pain	14	20	6	43	4
Cough	10	14	2	20	3
Nausea	8	11	3	38	2
Other	5	7	2	40	2

^aPercentage of the 71 patients who took some stand on 'late' symptoms.

^bPercentage of patients who had this 'late' symptom in the first place.

A total of 33 (out of 71) had 'late' symptoms and the total number of symptoms was 102.

hands. In fact, only one report could be found on a fatal manometry. It dealt with a 75-year-old man with a corkscrew-like deformation of a diffuse esophageal spasm.⁵ During a second manometry, the esophagus was perforated resulting to an incurable mediastinitis. There are no notes of perforation in a large database with approximately 6000 esophageal manometries from the North-east Medical District of London (Evans, unpublished data).

The fact that practically all patients had no previous experience of esophageal manometry probably enhanced the stress among patients: Segawa *et al.*⁶ found that heart rate increased during the first but not during subsequent gastroscopies.

Some patients had obvious difficulties, despite adequate guidance, in separating postoperative symptoms from general dysphoria. They typically had lengthy hospital records and were depressive also when seen on other occasions. However, one should be cautious not to completely overlook the long-lasting symptoms after esophageal manometry. The risk of serious complications is small but not non-existent. The physician gets a valuable hint from the

smoothness of the manometry regarding the patient's well-being and his or her expected recovery from the procedure. Symptoms related to manometry are typically local and fairly moderate. As to the treatment, adequate information is usually sufficient, not forgetting a warm consolation.

References

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