

Übersichten

Systematic Follow-up: A Concept for Evaluation of Operative Results in Duodenal Ulcer Patients

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Systematische Kontrolluntersuchung: Ein Konzept zur Ermittlung von Operationsresultaten bei Ulcus-duodeni-Patienten

Zusammenfassung. In einigen gastroenterologischen Zentren wurde für Patienten mit chronischem Ulcus duodeni das Konzept einer systematischen Kontrolluntersuchung entwickelt, bei der definierte Merkmale und Parameter vor und in bestimmten zeitlichen Intervallen nach der Operation erhoben wurden. Ihre Notwendigkeit läßt sich mit zahlreichen Argumenten beweisen und ihre Organisationsstruktur muß sorgfältig von einer unregelmäßig nach der Operation stattfindenden Nachuntersuchung unterschieden werden. Die systematische Kontrolluntersuchung liefert eine logische Grundlage für die Behandlung von Patienten, die nicht auf Erfahrungen aus persönlichen Eindrücken beruht. Die Technik bei Erhebung von Befunden in einer solchen systematischen Kontrolluntersuchung wirft viele Teilfragen auf, die in verschiedenen Zentren unterschiedlich beantwortet werden können, auf jeden Fall aber durch kontrollierte klinische Studien getestet werden müssen. Alle diese Bemühungen haben aber das Ziel, klinische Daten mit größerer Zuverlässigkeit und mit weniger persönlichem Vorurteil zu ermitteln als bisher. Es wird ein Konzept für die Erhebung von Operationsresultaten bei Patienten mit chronischem Ulcus duodeni dargestellt, wie es in Marburg durchgeführt wird. Die Befunde werden durch eine Serie von standardisierten Interviews und Untersuchungen erhoben. Die Diagnose, Indikation für die Operation und das Operationsresultat werden abschließend durch ein Rundtischgespräch von Experten ermittelt. Welche Rolle der theoretische Chirurg bei der systematischen Kontrolluntersuchung übernehmen kann, wird dargestellt. Schließlich wird die Anwendung dieses Prinzips sowohl für die Universitätskliniken als auch für Stadt- und Kreiskrankenhäuser empfohlen.

Schlüsselwörter: Systematische Kontrolluntersuchung – Unregelmäßige Nachuntersuchung – Ulcus duodeni – Vagotomie – theoretischer Chirurg – Rundtischgespräch.

Summary. For patients with chronic duodenal ulcer a systematic follow-up concept has been developed in several medical centers. Defined attributes and parameters are assessed in each of the patients before, and at several intervals after, operation. The necessity of such a follow-up can be defended on several grounds and by its organisational structure it can be differentiated from a simple and irregular medical check-up after operation. It provides a more rational basis for treating a patient than the “experience” made up by impressions. The question of logistics in such a gastric follow-up contains many subquestions which may be answered differently in different locations but have still to be tested by controlled clinical trials. All these considerations however have the common aim to assess clinical data more reliably and with less personal bias than before.

A concept for the evaluation of operative results in duodenal ulcer patients as has been started in Marburg is presented. Findings are obtained by a series of standardized interviews and examinations. Diagnoses, indications for operation and results of operation are established by a final decision made by a panel. A role for a theoretical surgeon in the follow-up is proposed. The possibility of performing a gastric follow-up is advocated both for University and district hospitals.

Key words: Systematic follow-up – irregular medical check-up – duodenal ulcer – vagotomy – theoretical surgeon – panel discussion.

“Eben with the highest artistic ability in surgical techniques one can do the wrong operation.”s Thus Baron

[1] replying to the argument that all-day operations should guarantee a great operative success in duodenal ulcer surgery by an especially high degree of dexterity in clinical experience. "Is it ethically justified to perform a "new" type of gastric vagotomy in 1000 patients without skillful, continuous and one-hundred percent follow-up of the first 50 patients?" Thus de Dombal [6], commenting on the proposition that 1000 operations performed by some continental surgeons are more conclusive for the benefit of a certain vagotomy than the only 200 operations carried out in Leeds. "We should no longer attend surgical meetings where a chairman is allowed to state: I have done the 2/3-resection with Billroth II anastomosis in duodenal ulcer disease for 30 years, I have always seen good results and we should continue to do so." This was the comment of Bengmark [2] on the question whether findings rather than authorities should influence the training of a young clinician in gastric surgery.

Why did three leading researcher workers in abdominal surgery judge so critically customs in electing surgical techniques for treatment of chronic duodenal ulcer disease which are still prevailing in so many countries? The answer can be found in the famous paper of Visick [46] who started the first gastric follow-up clinic together with Pulvertaft in York (England) in 1942 [34]: "The day of judging results by impression is past and it is only by carefully following up all patients and assessing their condition by an independent tribunal that we can gain a true picture of the effectiveness of any procedure."

The crux of the matter is not therefore an elegant operation, but how many patients survive and how they feel during the years after operation. These questions can be answered *only* by assessment of defined attributes and parameters before and after operation, a practice which we shall refer to as "systematic follow-up".

1. Reasons for the Necessity of Systematic Follow-up

We start from the principle that in systematic follow-up of the type advocated, clinical science and clinical practice are not contrasting but complementary factors. Under this condition we see four groups of reasons for the necessity to perform a systematic follow-up in relation to vagotomy (Table 1). These are in turn related especially to (i) clinical practice, (ii) the operators, (iii) the patients and (iv) clinical science in a more restricted sense.

(1) *Clinical practice* before and after vagotomy consists of diagnosis, pretreatment, the surgical procedure, assessment of short-term outcome and long term follow-up.

Table 1. Reasons for the necessity of systematic follow-up specifically applied to vagotomy

1. <i>Clinical practice</i>	Assessment of reliable frequencies and incidences of various attributes in duodenal ulcer patients (including concomitant diseases) Reexamination of indication for surgical treatment and avoidance of operation in certain cases Comparison of success rates following different surgical procedures Detection of early and late complications Advice for patients and recommendation of adjuvant therapy where necessary
2. <i>Surgeon</i>	Evaluation of personal success in operative treatment (for the single subject and the whole clinic) Protection against being falsely accused and against actions for damages Analysis of early complications relating to surgery and/or anaesthetic
3. <i>Patient</i>	Detection of different populations in different places or countries Evaluation of changes in environmental conditions Better treatment as a result of reasons given in (1) and (2)
4. <i>Clinical science</i>	Solving the problems of peptic ulcer pathogenesis in various populations Description of the natural course of peptic ulcer disease with and without various treatments Collection of data for controlled clinical trials Evaluation of the reliability of criteria and definitions in clinical trials Forum for exchanging ideas between clinical and basic science and for training of theoretical surgeons

Before and after operation reliable values for various attributes in the population should be known (Table 1), such as (before operation) length of case history, accompanying diseases, risk factors, and (post-operatively) recurrent ulcers, and symptoms like diarrhoea and dumping. *This can only be achieved by a follow-up for all patients treated by the doctors of the hospital.* We have observed that especially subjects being very highly satisfied or extremely disappointed by surgical treatment disliked to come to the follow-up clinic. In assessing recurrent ulcers for example the latter group was particularly important.

Systematic follow-up is necessary for continuous reexamination of the indications for surgical treatment and for avoiding operation in certain cases (Table 1). An example of this is "ulcer-like dyspepsia" without manifest ulcer. Recurrent symptoms can be predicted in these cases with such a high probability that opera-

tion should be avoided and psychological treatment seems mandatory [3, 32]. The importance of analysing the indications for surgery in the assessment of success rates has been pointed out among others by Thoroughman et al. [40] who showed a high incidence (10.4 percent) of poor results in cases classified preoperatively as "intractable" peptic ulcer.

Systematic follow-up is necessary for comparison of success rates following different surgical procedures. This is especially true if a standard operation, for instance a type of resection will be replaced by a certain type of vagotomy. At the moment this happens mostly in academic units, but there are an increasing number of district hospitals which adopt selective proximal vagotomy as the operation of choice for an uncomplicated duodenal ulcer.

Another major reason for performing a systematic follow-up is the detection of early and late complications after operation. Many side effects of gastric resections or vagotomies may not be known simply because the patients with these complications do not consult the surgeon but another specialist. Furthermore, side-effects may develop after operation at a point of time when the relationship between surgical treatment and symptoms is considered neither by the general practitioner nor by the patient. This was exemplified at our clinic by dysphagia after selective proximal vagotomy. This complication was observed sometimes during the first months after operation, but disappeared when the first follow-up 6 months after operation was performed.

Finally, advice to patients and recommendation of further therapy can be given at the follow-up clinic (Table 1). Diarrhoea and dumping possibly occur more frequently after vagotomy if a certain diet is taken by the patients. Moreover, associated diseases may demand a substitution by enzyme preparations. As a result of our follow-up experience a special diet is not necessary for duodenal ulcer patients after vagotomy, but sometimes the patients avoid certain foods because the general practitioners have forbidden them. The advice given to patients to eat all foods they like (based upon carefully collected evidence) and the subsequent improvement in quality of their life is one of benefits of the follow-up.

(2) For the *surgeon* systematic follow-up is highly important to evaluate his personal success in operations for treatment of peptic ulcer (Table 1). This is true, as well, for the single subject as for the whole clinic, in comparison to other hospitals. The question of "how successful is a surgical technique in my hands?" can be difficult to answer and vexacious under certain (especially emotional) conditions. But if a recurring postoperative problem can be eliminated by detecting and correcting it soon in the follow-up

clinic, this may also be highly satisfactory and — above all — is mandatory for ethical reasons. The influence of surgical training on the success of selective gastric and selective proximal vagotomy has been shown by Mason et al. [29] and by Liedberg et al. [24].

The influence of the ability of the individual surgeon on the results of truncal and selective gastric vagotomy has been demonstrated by Johnston and Goligher [18]. Without performing systematic follow-up in the strict sense described later on it is impossible to compare the results of one hospital with those of others even though different follow-up clinics may have different definitions and considerably varying results.

Systematic follow-up is the best means of protecting a doctor against being falsely accused and against legal actions filed for damage (Table 1). Unfortunately, it is very common to harm a surgeon by a whispering campaign like "his results are excellent only because the hospitals in his vicinity are treating the recurrent ulcers". For this reason it is also mandatory to ask both the patient and his general practitioner about details of any medical treatment for the time between two visits to the follow-up clinic.

Finally, analysis of early complications relating to surgery or the anaesthetics is an important function of an early follow-up clinic. Operative death and death at the hospital are the events of which a surgeon is naturally most afraid. In many clinical studies, however, it is never stated whether surgery or anaesthesia are related to death or complications although such situations are well recorded in the anaesthesiological literature [30, 47].

(3) Systematic follow-up is necessary for the *patient*. Certainly all the reasons described previously are important for the patient, too, but there are some special points concerning the patient.

Firstly, the detection of different populations of duodenal ulcer patients in different places or countries can be achieved best by systematic study in a follow-up clinic (Table 1). It seems remarkable that in Japan, the relation duodenal ulcer/gastric ulcer is not 5/1, but 1/5. Furthermore diarrhoea following vagotomy is observed with a much higher incidence in Britain than in a study performed in West Germany [38]. These differences may be explained by differences in population.

Secondly, changes in environmental conditions in the vicinity of a hospital may affect the operative success of a certain procedure, for instance industrialisation of a rural area with an increasing number of foreign workers, changes in social conditions and in the structure of ages (Table 1).

(4) Finally systematic study in a follow-up clinic is necessary for *clinical science* in a more specialized

Table 2. Comparison of the rate of data assessment in the Leeds/York Trial and Veterans Administration Hospitals Trial for surgical treatment of duodenal ulcer

Time after operation (years)	Patients being operated		Patients surviving up to follow-up		Patients being followed-up	
	(n)	(n) (%)	(n)	(n) (%)	(% of survivors)	(% of being operated)
2 (1-4)	375	362 97	360	99.4	96.0 ^a	
6 (5-8)	375	357 95	342	95.8	91.2 ^b	
2	1358	1296 95	1151	88.8	84.8 ^c	

^a Goligher et al. [11]^b Goligher et al. [12]^c Price et al. [33]. Only male subjects within the trials (escape excluded) were compared

definition (Table 1). It can attempt to solve problems of peptic ulcer pathogenesis in various populations [27, 41, 44]. There are good reasons to consider peptic ulcer disease as a multifactorial defect of gastric or duodenal mucosa. In the single patient increased acid

and pepsin secretion, increased parietal cell or chief cell mass, disturbances in the autoregulation of the antrum, a decreased release of secretin, or a long-lasting effect of the pepsin stabilizing factor (PSF) [14] may play a dominant etiological role. The true frequencies of such populations can only be evaluated by systematic follow-up.

The natural course of peptic ulcer disease with and without various treatments can only be described in a systematic follow-up (Table 1). Kennedy et al. [21] for example showed particularly well that after selective proximal vagotomy the incidence of diarrhoea and dumping observed was no more than that in patients without surgical treatment.

Systematic follow-up also is necessary to collect the complete data material for controlled clinical trials (Table 1). It is an experience obtained from many studies on duodenal ulcer surgery [13, 43] that the difference between the results of various operative procedures are very small. Thus, only a handful of patients operated upon, but not included in the follow-up may decide the significance or non-significance of a criterion. In the Leeds/York trial Goligher et al. [11, 12] succeeded in assessing 99.4 per cent of the surviving

Table 3. Differences between gastric follow-up clinic and usual medical check-up of duodenal ulcer patients following operations

Criterion	Systematic follow-up	Medical check-up
<i>Patient:</i>		
Rate of assessment	All patients treated, at least 95 per cent of survivors	Some patients treated, an irregular and undefined part of the total sample, useless for subsequent analysis
Date of assessment	Before and after operation, regular (e.g. half-year) dates, more than one assessment	After operation irregular and only occasionally, only one assessment
<i>Observer:</i>		
Qualification for assessment	Specialized experts, experienced, well trained and interested	Qualification not defined, collection and evaluation of data often by medical students
Relation to operative treatment	Not at all (observer independence) or at least only in part engaged in the operation (panel)	Decision of success or failure by the operator (no exclusion of personal bias)
Date of assessment	Every week as an organisational structure in the hospital	Irregular, depending on cases or isolated interesting problems.
<i>Organiser:</i>		
Qualification for work	Self-dependent and self-acting subjects who are solely employed for the follow-up clinic	None. The over-worked operator or anybody else is doing it as an additional job
Accessibility for patients or specialists	Every working-day by personal contact, phone or writing	Not at all or irregular and not continuously, especially because of the routine-work of a surgeon
<i>Technique of Assessment:</i>		
Attempts to prevent bias	Blind or double-blind technique	No special care
Technique for the interview	Panel discussion of the specialists with the patient or panel decision after separate interviews	No interview or interview of untrained subjects (medical students, junior doctors) with the patients
Organisational structure	Interview using a defined questionnaire	Interview without a definite protocol and without written down definitions leading to unreliable assessment

Table 4. Some logistic considerations in the performance of a gastric follow-up clinic

Logistic Problem	Proposed solution	References
Who should record the data?	Only the operator	De Miguel [7]
	Only physicians independent of the operator	Sawyers et al. [37]
	Surgeon and physician	Hedenstedt and Moberg [16]
	Surgeon and theoretical surgeon	Troidl et al. [44]
	Panel consisting of surgeons, physicians, psychologists, theoretical surgeons etc.	Visick [46], Forrest [9], Goligher et al. [11, 12], Seidel et al. [38], this paper
Where and how should the data be recorded?	<i>In the hospital:</i>	
	Protocol with questions and clinical findings filled-up in panel	Goligher et al. [11, 12]
	Separate interviews plus panel and final decision in panel	Troidl et al. [44]
	<i>At the patients home:</i>	
	Visit at home by observer	Visick [46], Dean et al. [5], Lorenz and Rohde [25] Hoerr [17]
	Only questionnaire through postage	
	Visit at home by family doctor	Orr [31]
	Interview strictly standardized and short to prevent suggestive effects	Cox [4]
	Sequence of questions defined	Gill et al. [10]
How much time should elapse from operation to follow-up?	Pre- and postoperative follow-up	Kronborg [23], this paper
	1/2–1 year over the years (no limitation)	Goligher et al. [11, 12]
	1/2, 2 and 5 years long-term (more than 10 years)	Price et al. [33], Troidl et al. [43]
How often should follow-up occur?	Every 1/2–1 year	Visick [46], Goligher et al. [11,12], Small and Krause [39]
	Only once	Kemp [19]

patients and 96 per cent of the subjects being operated, whereas in the Veterans Administration Hospitals trial [33] the corresponding rates were 88.8 and 84.8 per cent (Table 2). The rate of data assessment in the Leeds/York trial was higher after 5–8 years than in the latter trial after 2 years. This may be considered as a success of the excellent follow-up clinic being performed in Leeds.

Many controlled clinical trials have been unsuccessful in the past because the criteria and definitions of attributes or parameters were unreliable [15]. Tests on the reliability of criteria, however, can repeatedly be performed only in a systematic follow-up (Table 1). An example for this is the overall clinical classification according to Visick [46] which shows a great inter-observer difference [15] — differences which disappear after systematic discussion and definition of terminology. Other examples are the definition of pain [10] and that of recurrent ulcer [43].

Finally, the systematic follow-up is the most important forum for exchanging ideas between clinical

research and basic research and for training of theoretical surgeons [28] (Table 1). In the Marburg, experiment on surgical research the follow-up clinic bears a central importance on all working teams: Biochemists, pharmacologists and pathologists can obtain their clinical training by this way and problems arising in the follow-up clinic are immediately used to start experiments in animals [28]. A follow-up clinic is therefore a very important organisational structure for the urgently needed integration between clinical and basic research.

2. Principles and Practical Aspects of a Gastric Follow-up Clinic: Its Differentiation from a Simple and Irregular Medical Check-up after Operation

Gastric follow-up clinics have been established with great success among others in York [46], Leeds [11], Airedale [6], Edinburgh and Uppsala [39], Belfast [20], Copenhagen [23] and initiated and managed by H.

Troidl in Marburg for the first time in Germany [28, 38, 44]. The term "systematic follow-up" depends on certain conditions which have to be fulfilled and should be strictly separated from the practice usually accepted in many countries of checking-up irregular, limited numbers of patients at irregular times after treatment (Table 3).

In principle the follow-up clinic is an organisational structure in contrast to the occasional medical check-up of patients. In this way it is always prospective and allows for assessment and collection of data from patients, implying a small loss of information and a high reliability. It provides the doctor with a less haphazard and therefore more relevant and concentrated "experience" than the usual way of clinical training and produces a more rational basis of treating a patient than the "experience" made up by impressions.

The question "how to set up and run a follow-up clinic" contains a couple of subquestions which may be differently answered under different conditions [36]. *But it should be emphasized on this occasion that answers to these questions finally must be obtained by controlled clinical trials* [10, 15]. Some of the practical aspects of running a gastric follow-up clinic are listed up in Table 4. All these considerations have the aim to assess, with more precision and accuracy and with less personal bias than before; clinical attributes the definition, reliability and significance of which often are very difficult to ensure.

Concerning the composition of the group of observers in a panel special attention should be given to the theoretical surgeon (Table 4). In the Marburg "setup" [28], it is one of the functions of basic research workers in experimental surgery to participate in the follow-up clinic and to take over some of its organisation.

In many centers throughout the world it has been conclusively demonstrated that the recording and analysis of biochemical and "clinical chemical" data is enormously promoted and enhanced by *continuing clinical contact* for the theoretical staff. The laboratory work in certain studies on gastrointestinal hormones may be on a high basic research standard but cannot reach much scientific significance due to unreliable diagnosis and to wrong classification of the patients. It was the aim of one of our trials [44] to overcome especially this difficulty.

In Marburg, the systematic follow-up comprises the investigations listed in Table 5. It should be stressed that all patients coming to the follow-up clinic for duodenal or gastric ulcer undergo all of the investigations. Some of the results obtained from this follow-up are published [38, 44] or just prepared for publication [45].

Table 5. Investigations in the Marburg gastric follow-up clinic before and after vagotomy

Findings obtained by

1. Case history (completed by data from other hospitals)
2. Filling-up a questionnaire of 60 questions first by the patient, then by the panel of observers
3. Examination with a defined protocol by a physician unaware of operation who later on is seeing the patient in the panel for a second time
4. Examination by a psychologist and sociologist in a team (Managed by G. Overbeck, Clinic for psychosomatic diseases, University of Giessen)
5. Endoscopy of oesophagus, stomach and duodenum with taking biopsy specimens for pathological and sometimes biochemical examination
6. Radiological examination of stomach, intestinum and gall-bladder using defined techniques and questions to the radiologists
7. Gastric secretory tests using pentagastrin and insulin in standardized procedures (26, 42) and under quality control conditions (35). In single cases, if indicated, secretory tests in combination with serum gastrin determinations were performed following stimulation by a Oxo meal, secretin, glucagon and calcium
8. Routine clinical-chemical examinations
9. Surgical protocol of the operation

Diagnosis, indication for operation and results of operation established by a final decision made by a panel discussion of surgeons, theoretical surgeon and physician

3. Possibility of Performing a Systematic Follow-up at University Hospitals and at District Hospitals

The existence of gastric follow-up clinics in England, Scotland, the United States, Scandinavia and Marburg shows that these institutions can be established though expenditure in staff, money and time is necessary. In University hospitals specialisation such as in England, in USA and Scandinavia, or a combination of clinical with theoretical surgeons (such as in Marburg) enable follow-up clinics to be created and kept alive over the years. Lack of staff, rooms, money and time are, however, problems which no doubt slow down or hinder the development of follow-up clinics in small district hospitals. However De Miguel in Spain [7] showed that a follow-up clinic *can* be started and continued over more than 5 years also under such sometimes unfavourable conditions. This author is involved in duodenal ulcer surgery and his results have been of considerable interest to surgeons all over the world. This is especially due to the fact that the clinical trials of De Miguel have *not* been performed at University hospitals, but under conditions which concerning medical care much more closely resemble those prevailing for the great majority of people than University hospitals.

Indeed, on the international scene the whole "focus" of surgical research is being extended to include not only University but small surgical units — for the very reason that these small units represent an important sector of surgical care. In Great Britain, many consultants have their own systematic follow-up methods and conduct special "follow-up clinics" [8]. This whole problem is dealt with in greater detail elsewhere [36], but for now it should be noted that lack of staff, money, etc. constitute not an unsurmountable bar to rational and systematic follow-up.

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