

CAPSULE ENDOSCOPIES OF
THE SMALL INTESTINE
- a Health Technology Assessment

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CAPSULE ENDOSCOPIES OF THE SMALL INTESTINE – a Health Technology Assessment

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Capsule endoscopies of the small intestine – a Health Technology Assessment

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Summary

Background

The length and the anatomic localisation of the small intestine have until a few years ago represented a large diagnostic challenge. Previously, x-ray examination of the small intestine was the only commonly used supplementary non-invasive examination. Since 2002, capsule endoscopy of the small intestine has been available in Denmark. The examination was primarily introduced for clarification of source of bleeding in the small intestine, however, it is also to a greater extent applied with diagnosis and monitoring of Crohn's disease in the small intestine. Furthermore, rare varieties of polyposis and other diseases of the small intestine are controlled with capsule endoscopy. The technology allows the small intestinal mucous membrane to be visualised by means of gentle and non-invasive methods, which may be carried out as ambulant treatment and without the patient being exposed to x-ray radiation. During the past five years, the use of capsule endoscopy has spread extensively in Denmark and is presently done in 10 Danish hospitals.

Few contraindications exist – e.g. pregnancy and pacemaker treatment – the last-mentioned, however, is relative. The complication rate is low – below 5% – whereof the most important one is a retained capsule – i.e. a capsule that remains in the intestinal system in more than 14 days – often due to an unappreciated stenosis in the intestine.

From a health technology assessment perspective, examination based on capsule endoscopy is interesting as the technology on one hand is relatively new in Denmark, which is why the diffusion and the possible applications still are being developed. On the other hand, the examination has already been applied in a number of hospitals and departments, which means that these hospitals have experience with the technology.

A medical health technology assessment may contribute with an overview of the extent to which the examination is applied in Denmark as well as it may address the technology from a future-oriented perspective as concerns the future diffusion and application of the examination.

Technology

The chapter is divided in two parts.

The first part is based on a literature review focusing on the latest international literature regarding indication, diagnostic value and possible side effects. The following diagnostic and therapeutic strategy is estimated.

The second part is based on the results of a retrospective review of journals from 100 consecutively chosen patients with obscure gastrointestinal bleeding, who all have been examined with capsule endoscopy at Aarhus Hospital. Based on a period of one year before examination with capsule endoscopy, information based on these patients' hospital contacts has been collected. This information is compared with the corresponding variables for a period of one year after the examination among the same group of patients. This comparison documents a significant decrease in the number of gastroscopies, colonoscopies, ultrasound examinations and small intestinal passages in the period after the examination with capsule endoscopy compared with the period before. On the contrary, an increase in the number of CT-scans of abdomen with the purpose of demonstrating extra intestinal bleeding sources occurred. Furthermore, a decrease occurred in the number of hospital contacts, the number of bed-days and the number of blood transfusions on patients in the period after investigation with capsule endoscopy.

The organisation

A number of characteristics on the organisation of the examination and the performance of the examination, respectively, are described in the health technology assessment. In the Danish departments that carry out the examinations, it is typically the physicians who make the actual interpretation of the pictorial material, while the nursing staff mount and remove the equipment. In the international literature, documentation exists on the possibility of leaving the interpretation of the pictures with specially trained nursing staff.

Furthermore, a description is given of the indications for examination of capsule endoscopy in connection with obscure gastrointestinal bleeding and a description of the learning curve and the quality developing initiatives in the Danish departments that carry out the examinations.

The patient

This chapter describes the patients' own evaluations of examination with capsule endoscopy: It is very patient-friendly and gentle, and 90% of the patients even express their satisfaction with the examination. Furthermore, a description is given of the patients' own evaluations of the effect of capsule endoscopy: 24% of the patients express that the examination to a great extent or to some extent has contributed to improving their health condition.

Furthermore, a description is given of the patients' satisfaction with personnel, facilities and information level. This part of the patients' answers is specifically related to the conditions at Medical Hepato-gastroenterological department at Aarhus Hospital.

The economy

Initially, a short description is given of the economy by introducing capsule endoscopy. It is possible to conclude that the direct costs by carrying out the examination as ambulant procedure is approximately covered from the current diagnose-related-group (DRG) fee.

Subsequently, based on the journal review, a statement of the DRG-production value of all hospital contacts in a period of one year before examination with capsule endoscopy has been made. This statement is compared with a corresponding period of one year after the examination with capsule endoscopy. The conclusion is a decrease in the DRG-production value in the period after the examination compared with the period before the examination. Furthermore, a decrease occurred in the number of admissions and ambulant visits related to small intestinal x-ray examinations and upper and lower endoscopies.

Future perspective

The clinical outcome of the findings of capsule endoscopy in connection with gastrointestinal bleeding has still not been evaluated sufficiently; however, several investigations indicate that the largest diagnostic and therapeutic output is achieved, when the examination with capsule endoscopy is done shortly after a bleeding episode. Consequently, an increase in the number of examinations with capsule endoscopy in connection with acute bleeding is likely to occur – not least in relation to the development of software which makes it possible to estimate the findings during the examination and not only after the examination. Finally, a continuous development of risk stratification of bleeding suspicious areas is expected – especially diffuse angiodysplasia continuously represent a therapeutic challenge.

The application of clinical databases with a harmonisation of indication, treatment strategy and follow-up are relevant issues regarding capsule endoscopy among patients with obscure gastrointestinal bleedings.