

Endosonography in the diagnosis of recurrent anal fistulas

Iwona Sudół-Szopinska¹, Wiesław Jakubowski¹, Malgorzata Kolodziejczak²,
Tomasz Szopinski³, Anna K. Panorska⁴

¹Department of Diagnostic Imaging, Medical University Warsaw and Central Institute for Labour Protection – National Research Institute, Warsaw, Poland; ²Subdepartment of Proctology, Srodmiejski Hospital, Warsaw, Poland; ³Department of Urology, Central Railway Hospital, Warsaw-Miedzylesie 4, Department of Mathematics and Statistics, University of Nevada, Reno, USA,

Background. The aim of this work was to compare non-contrast endosonography (NCE) and contrast-enhanced endosonography (CEE) in the diagnostics of recurrent anal fistulas.

Methods. In the years 1999-2002 we diagnosed 148 patients with anal fistulas. Fifty-one out of this group had recurrent anal fistulas, remaining had primary disease. For anal endosonography a Bruel&Kjaer scanner with 7.0 MHz transducer was used and 3% solution of hydrogen peroxide was used for CEE. In each case, NCE was followed by CEE, and results of both methods were compared.

Results. The difference of percentages of correct diagnoses between NCE and CEE carried out 35.29% in a group of patients with recurrent anal fistulas (95% confidence interval 50.5% - 20.09%); while the difference in a group of patients with primary anal fistulas was only 4.55% (95% confidence interval 11.09% - 2.00%).

Conclusions. CEE significantly improves the efficiency of endosonography in diagnosing recurrent anal fistulas, whereas in primary fistulas the value of NCE and CEE is comparable.

Key words: rectal fistula-diagnosis; endosonography; recurrence

Introduction

The accuracy of anal endosonography (AES) in diagnosing the type of anal fistula, accord-

ing to different authors, is from 25% to 100% and in cases of recurrent fistulas is the lowest.¹⁻⁴ In spite of underlined difficulties resulting first of all from impossibilities of the differentiation of fistula with scar, this problem has still not been examined exactly. This study presents the own results of standard, non -contrast endosonography (NCE) and contrast-enhanced endosonography (CEE) in diagnosing the recurrent anal fistulas, and compares them with the ones obtained in the group of primary fistulas.

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Address to correspondence: Assist. Prof. Iwona Sudół-Szopinska, MD, PhD, Zakład Diagnostyki Obrazowej, Wojewodzki Szpital Brodnowski, ul Kondratowicza 8, 03-285 Warsaw; Fax +(48)22 326 5991; E-mail: iwsud@ciop.pl

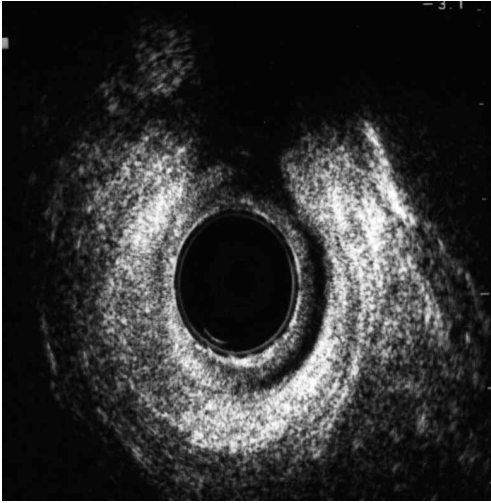


Figure 1a. Recurrent anterior transsphincteric fistula in a woman following obstetric anal sphincter trauma: complex fistula in NCE located in mid/low anal canal.

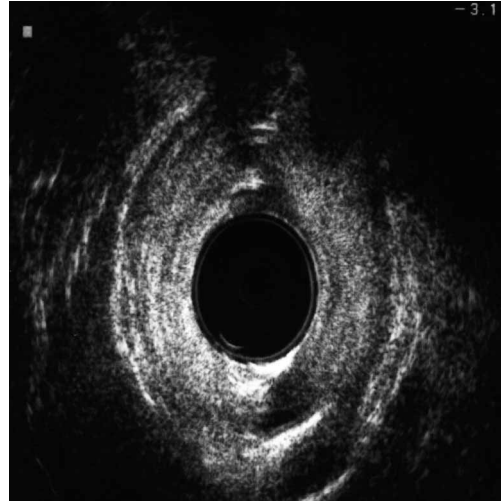


Figure 1b. Recurrent anterior transsphincteric fistula in a woman following obstetric anal sphincter trauma: simple fistula in CEE, located in the distal part of the scar tissues.

Methods

In years 1999-2002 AES was performed at 148 patients (86 male and 62 female, aged between 15 to 73 years, average 46.3 years) with the clinical diagnosis of anal fistulas. In 51 from among 148 persons fistula had a recurrent character. AES was performed by one experienced radiologist, and patients were operated by surgeons from different centres, from which one drove a compact cooperation. In order to compare NCE with CEE only fistulas which on a day of executing research had a permeable external outlet were diagnosed.

For AES a Bruel&Kjaer scanner 3535 with a mechanical transducer of frequency 7.0 MHz with the plastic cone or water balloon was used.² No preparation was necessary prior to AES. Patients were examined in the left-lateral position with knees pulled up to abdomen. The study was performed in two-steps. The initial type of anal fistula using Park's classification was defined,⁵ together with differentiation between simple and complex fistula, and the location of the internal opening of this fistula was defined. It was fol-

lowed by CEE, given through the external opening, and with the use of silicone catheter (Nelaton 10-fr), 1-2 ml of contrast which was 3% solution of hydrogen peroxide.^{3,6,7} Again one estimated the type of fistula, including the presence of extensions, and location of internal opening. And then results obtained in both, NCE and CEE, were compared. For testing statistical differences between proportions of correct diagnoses in NCE and CEE methods for comparisons of dependent proportion were used.¹ Results of NCE and CEE were compared with surgery. The interval between AES and the operation did not exceed 8 days (1-8 days, average 2.8 days).

Results

In a group of 51 persons with recurrent anal fistulas one ascertained: 37 transsphincteric fistulas, 10 intersphincteric, 3 suprasphincteric, and 1 extrasphincteric (Table 1). Initially in NCE 40.8% of fistulas were simple, and 59.2% had extensions. After a contrast injection CEE showed that 82.4% of fistulas

Table 1. Comparison of non-contrast endosonography (NCE) and contrast-enhanced endosonography (CEE) in differentiation simple from complex fistulas in 51 patients with recurrent anal fistulas

Type and number	NCE		CEE		Surgery	
	simple	complex	simple	complex	simple	complex
transsphincters 37	14	23	32	5	30	7
intersphincteric 10	5	5	8	2	8	2
suprasphincteric 3	1	0	1	2	1	2
extrasphincteric 1	0	1	1	0	1	0

were simple, and only 17.6% were complex. From among all of complicated fistulas shown in NCE, in CEE one did not confirm the presence of extensions in 68, 9% of fistulas; changes described as extensions represented scars after the treatment of fistula (Figures 1a, 1b).

Surgery confirmed most of diagnoses of CEE and showed 78.4% of simple fistulas and 21.6% complex ones.

A statistical analysis was performed in order to qualify whether CEE is significantly more exact in differentiation simple from complex recurrent anal fistulas than NCE. In NCE correct diagnoses were obtained in 56.86%, whereas in CEE 92.16%. The difference of percentages of correct diagnoses between NCE and CEE carried out 35.29% and a 95% confidence interval for this difference was from 50.5% to 20.09%. A significant difference was showed between NCE and CEE in differentiating of simple and complex recurrent fistulas ($p < 0.0006$), which proved that CEE is significantly more exact in differentiating simple from complex recurrent anal fistulas. The divergence between CEE and surgery is ascertained only in two transsphincteric fistulas. The injection of contrast exten-

sions were not confirmed, in spite of the fact that the former ones were visible in NCE and became confirmed during the surgery. However, the general efficiency of CEE was significantly greater than that of NCE which proved to be not reliable of differentiating scars with the active fistula. The percentage of falsely positive diagnoses of complex fistulas in NCE carried out 36.7% (18 from 49 fistulas found in NCE), in CEE falsely positive results did not ascertain.

To confirm the diagnostic value of the use of contrast in the investigation of recurrent fistulas, the above results were compared with the endosonographic image of primary fistulas (Table 2). To compare this analysis more accurately, only the types of primary fistulas which were found in a group of recurrent fistulas (i.e. transsphincteric, intersphincteric, suprasphincteric, and extrasphincteric) were included. In NCE 89.9% of simple, and 10.1% of complex fistulas were found. After the contrast administration 97.1% appeared simple and 2.99% had extensions. By the surgery 97% were found simple, and 3% complex, similarly as in CEE.

Identical as for recurrent fistulas a statistical analysis was done for the primary fistulas.

Table 2. Comparison of non-contrast endosonography (NCE) and contrast-enhanced endosonography (CEE) in differentiation simple from complex fistulas in 66 patients with primary anal fistulas

Type and number	NCE		CEE		Surgery	
	simple	complex	simple	complex	simple	complex
transsphincteric 36	31	5	34	2	34	2
intersphincteric 13	12	1	13	0	13	0
suprasphincteric 7	10	0	8	0	7	0
extrasphincteric 10	9	1	10	0	10	0

In NCE 93.94% of correct diagnoses were obtained and in CEE 98.48%. The difference between percentage of correct diagnoses in NCE and CEE was 4.55% and 95% confidence interval was from 11.09% to 2.00%. A statistical difference between NCE and CEE in differentiating simple from complex primary fistulas was found at the level of significance $p=0.09$. The test was not characteristic on 5% but only on 10% level. Therefore it is ascertained that CEE only slightly improves the diagnostic accuracy of endosonography for the primary anal fistulas.

Discussion

Cheong *et al*³ underlines that CEE is especially precious in diagnosing recurrent and complex anal fistulas. Our statistical analysis confirmed that for recurrent anal fistulas CEE is significantly more accurate than NCE ($p<0.0006$). In NCE 36.7% of falsely positive diagnoses of complex fistulas were found, in CEE such results were not observed. The efficient treatment of fistula depends on the eradication of all extensions. However, limitations of AES in patients with a history of surgery of anal fistula or abscess, resulting from difficulties in differentiating scars with the active fistula, and especially with its extensions, were well known.^{3,4,8} Although Law *et al*⁹ describes that the scar has lower and more homogeneous echogenicity than the fistula and smooth outlines as well; the most often image of these two is identical. Additionally narrow, irregular lumen of the recurrent fistula and its extensions has often no content liquid or air, which have a characteristic image.⁶ Consequently not recognized and not removed extensions are the main reasons of the recurrence of fistula, and a wrong estimated type of fistula can lead to damages of anal sphincters.^{3,4,8}

In spite of underlined difficulties with endosonographic diagnostics of recurrent fistu-

las, one did not examine the scale of this problem. This study confirmed a large number of false diagnoses of complex fistulas in NCE. A comparative analysis with primary fistulas showed that in a group of primary fistulas it had a place only in 7.2% of fistulas. In NCE scars following previous surgery were interpreted as extensions, and so the accuracy in such differentiation was only 56.86%. The introduction of contrast raised to 92.16%. Also Cheong *et al*³ and Kruskal *et al*⁶ emphasized that only CEE can be accurate. Using CEE Kruskal *et al* accurately differentiated scars with fistulas in 20 from 30 patients (67%), including 39 patients with a doubtfully initial, without contrast, image. Our results showed that in only in two cases (4%) extensions of transsphincteric fistulas were not recognized in CEE. One ran in the direction of the top of ischio-rectal fossa, the second crossed the levator ani muscle. The former was probably blocked by thick secretion, and the latter would become visible when AES was supplemented by the use of a water balloon. In this case, however, too hastily initial NCE became interpreted as scar and one did not extend the investigation of ampulla of the rectum. It seems that such an approach should be done in case of high fistulas, especially the recurrent ones. The other thing is that, in spite of the proved significantly higher accuracy of CEE, one should also taken into account the result of NCE. Results obtained in a group of primary fistulas (66 patients) diametrically differed from those of the recurrent ones.

The number of complex fistulas was not large, both in NCE and in CEE, and the percentage of falsely diagnosed complex fistulas in NCE was only 7.24%. As in a case of recurrent fistulas, the scars after the treatment of fistula were responsible for correct diagnoses; so, in the primary fistulas the only reason was the inability to differentiate extensions from the heterogeneous echotexture of perirectal tissues. A statistical analysis showed

that NCE has comparable values to CEE. However, although it seems that it is more important not to miss the extension that gives a false diagnosis of extension (regarding the risk of surgical complications: recurrence, damage of sphincters), one must remember that too aggressive approach during the operation, in order to find indicated in NCE extensions, can also lead to complications - creating of iatrogenic fistula.

Conclusions

1. Standard, NCE is not reliable method in differentiation scars with active recurrent fistula and application of contrast significantly improves efficacy of AES.
2. In the case of primary anal fistulas, NCE and CEE have comparable efficiency.

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