Endosonography in the diagnosis of recurrent anal fistulas

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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, according to different authors, is from 25% to 100% and in cases of recurrent fistulas is the lowest. 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.
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. 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, together with differentiation between simple and complex fistula, and the location of the internal opening of this fistula was defined. It was followed 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. 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. 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

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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 fistu-
las in NCE carried out 36.7% (18 from 49 fis-
tulas 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 re-
current fistulas (i.e. transsphincteric, inter-
sphincteric, suprasphincteric, and extras-
phincteric) 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 exten-
sions. By the surgery 97% were found simple,
and 3% complex, similarly as in CEE.

Identical as for recurrent fistulas a statisti-
cal analysis was done for the primary 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

<table>
<thead>
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<th>Type and number</th>
<th>NCE</th>
<th>CEE</th>
<th>Surgery</th>
</tr>
</thead>
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<tr>
<td></td>
<td>simple</td>
<td>complex</td>
<td>simple</td>
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<tr>
<td>transsphincteric</td>
<td>37</td>
<td></td>
<td>14</td>
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<tr>
<td>intersphincteric</td>
<td>10</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>suprasphincteric</td>
<td>3</td>
<td></td>
<td>1</td>
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<td>extrasphincteric</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type and number</th>
<th>NCE</th>
<th>CEE</th>
<th>Surgery</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>simple</td>
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</tr>
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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 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. Although Law et al 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. 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.

In spite of underlined difficulties with endosonographic diagnostics of recurrent fistulas, 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 and Kruskal et al 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.

References


