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<td>OZDEMIR, Enver</td>
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SCLEROTHERAPY OF TESTICULAR HYDROCELES WITH 3% AQUEOUS PHENOL

Enver Özdemir
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With the evolution of minimally invasive approaches in medicine, phenol has regained its popularity for the sclerotherapy of testicular hydroceles. Together with reported efficiency and safety of 2.5% phenol in the literature, the recently proved safety of 3% phenol in esophageal variceal sclerotherapy has led us to perform a prospective study to lessen the number of sessions. Sclerotherapy with 3% aqueous phenol was applied on an ambulatory basis to 23 patients with 31 hydroceles, who were over 40 years old and who had no fertility problems. The overall cure rate was 96% with an average follow-up of 3 years, and 58% of the hydroceles required only one session of treatment. The average number of treatment sessions was 2.2 (range: 1-7). One patient with a history of herniorrhaphy 10 years earlier, was treated surgically following failure of seven sclerotherapy sessions.

Phenol, a sclerosant superior to other conventional agents including tetracyclines, requires neither anesthetics nor prophylactic antibiotics. Our findings indicate that sclerotherapy with 3% phenol is an effective, economical and safe form of therapy for patients with hydrocele.

Key words: Hydrocele, Sclerotherapy, Phenol

INTRODUCTION

Hydrocele is the accumulation of fluid of more than 3-5 ml between the parietal and visceral layers of the tunica vaginalis.1-4) Reportedly, William of Saliceto first used sclerotherapy in the Xl1th. century, and among others, even ginger and sugar were used as sclerosant agents.5) Since then the effectiveness of sclerotherapy has been debated, and even condemned as an unproven way of treatment6). With the evolution of minimally invasive approaches in different medical disciplines, sclerotherapy for hydrocele has again become a matter of clinical research-work to find better sclerosant agents with minimal discomfort and side effects. The currently used sclerosant agents in hydrocele therapy are tetracycline, tetradeyl sulfate, phenol, rolitetracycline, oxytetracycline, polidocanol and ethanol amine olate.6-17) With all of these sclerosant agents 25-100% success rates have been reported.1-17)

Recently, phenol has regained its popularity as an effective and safe sclerosant agent in various conditions such as hemorrhoids, esophageal varices, idiopathic pruritis ani, and pilonidal sinus.18-20) Together with the reported efficiency and safety of 2.5% phenol in literature,12,4,9) the recently proved safety of 3% phenol in esophageal variceal sclerosis19) has led us to perform this prospective study to lessen the number of application sessions. This is the first study using 3% aqueous phenol for hydrocele sclerotherapy.

PATIENTS AND METHODS

Twenty-three patients with 31 hydroceles were treated with aspiration and sclerotherapy using 3% aqueous phenol. Prior to application, all of the patients were fully examined including systemic and urological examinations. Patients, more than 40 years old, with no fertility problem, ipsilateral hernia, ipsilateral patent processus vaginalis, acute and chronic infection and previous unsuccessful aspiration with or without sclerotherapy were studied. Thus, only simple hydroceles were chosen with the exclusion of complicated hydroceles, multilocular hydroceles, pyocele, hematocoele and tumor suspected cases. A complete blood count, scrotal transillumination, scrotal ultrasound examination, and complete biochemical analyses of serum were done. After being informed, the patients were offered sclerotherapy and consent was obtained.

All patients were treated on an outpatient basis. The lithotomy position was provided, without analgesics, anesthetics and prophylactic antibiotics. Under the guidance of transillumination, the hydrocele sac was punctured with a 14-gauge intravenous catheter, the mandren was removed and the hydrocele fluid was aspirated with a 20 ml syringe gently assisted by manipulation. The volume of the fluid was recorded and specimens of fluid were obtained. Evaluations of glucose, urea, creatinine, electrolytes (Na, K, Ca, Mg, PO4), blood proteins (albumin, globulin), uric acid, lipids, enzymes (ALT, AST, ALP, LDH, Acid phosphatase, PAP, CK-MB) were done. The fluid was examined.
cytologically after centrifugation and bacteriologic culture was obtained if the fluid was suspicious in appearance.

After completion of aspiration, previously prepared and autoclaved 3%-phenol solution in distilled water was instilled. The volume of sclerosant instilled was calculated as 1 ml sclerosant per 10 ml fluid volume, with a maximum of 20 ml. The intravenous catheter was removed and the scrotum was gently palpated to ensure distribution of the sclerosant solution. The patients were observed for an hour and the specimens were sent for laboratory examinations. The patients were re-examined at 21 day periods, and if there was any recurrence, instillation was repeated up to seven times. Cure was defined as the absence of fluid accumulation by transillumination examination in the scrotum at least 3 months after the last application.

**RESULTS**

Table 1 shows the patients profiles The overall cure rate was 95.66% with an average follow-up of 3 years. The number of treatments required were; 1 injection for 5 hydroceles, 2 injections for 17 hydroceles, 3 injections for 8 hydroceles. One patient (4.34%) with a history of herniorraphy operation 10 years ago was surgically treated after an hour and the specimens were suspected. Hematocele was developed in only one patient (4.34%) with a history of herniorraphy.

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Number of session</th>
<th>History (year)</th>
<th>Fluid volume (ml)</th>
<th>Phenol volume (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational minor trauma</td>
<td></td>
<td>23</td>
<td>40-75 (58±10)</td>
<td>20-500 (180±141)</td>
</tr>
<tr>
<td>Orchiepididymitis</td>
<td></td>
<td>0.1-40 (8±9)</td>
<td></td>
<td>2-20 (13±7)</td>
</tr>
<tr>
<td>Inguinal operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major trauma</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Post-prostatetmetic orchitis</td>
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<td></td>
</tr>
<tr>
<td>Laterality</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Right</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilateral</td>
<td></td>
<td>8</td>
<td></td>
<td></td>
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Table 1. Patients profiles

<table>
<thead>
<tr>
<th>Range (mean±SD)</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases</td>
<td>23</td>
</tr>
<tr>
<td>Age (year)</td>
<td>40-75 (58±10)</td>
</tr>
<tr>
<td>History (year)</td>
<td>0.1-40 (8±9)</td>
</tr>
<tr>
<td>Fluid volume (ml)</td>
<td>20-500 (180±141)</td>
</tr>
<tr>
<td>Phenol volume (ml)</td>
<td>2-20 (13±7)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The high overall cure rate and low incidence of complications, in our study, is consistent with previous reports using 2.5% phenol.²,³ Nash² reported a 96% success rate with 2.5 phenol, MacFarlane¹ reported a 100% success rate, and followed by a similar success rate of Savion et al.⁵ We used 3% phenol and achieved almost the same success rate (95%). With tetracyclines, Bodker et al.⁷ reported a 90% success rate in only 10 patients, followed by a 96% success rate reported by Rencken et al.⁵ Shimamura et al.⁷ reported an 83% success rate with minocycline and Yokoo et al.⁸, reported a 70% success rate with the same agent. However, Badenoch et al.⁹ have reported a 33% success rate in 15 patients. With local anesthetic sclerosant agents other than phenol, such as ethanolamine oleate and polidocanol, the reported success rates range from 37 to 87.¹⁵-¹⁷

Together with lower success rates of other sclerosant agents, the high success rates with no
sclerosant may leak into the interstitial space and subsequently cause a chemical injury. In this study, no inflammatory reaction such as induration and fibrosis have been observed. This is probably due to the use of cannula that reportedly minimizes the possibility of trauma to the intrascrotal contents. There were no cases of sepsis after phenol sclerotherapy in this study. Thus, phenol sclerotherapy is a safe and effective therapeutic modality for hydrocele, and phenol is less irritating than other drugs including tetracycline and tetracycl sulfate. Recently, phenol has been gaining popularity as a sclerosant agent in various diseases other than variceal sclerotherapy with a success rate of up to 92.5%, the cure rate increased by repeated applications in many studies. Three percent aqueous phenol was also used for endoscopic esophageal sclerotherapy with a success rate of up to 84%, and postmortem histopathological examinations of 15 patients who died following sclerotherapy revealed no esophageal wall necrosis, perforation or mediastinitis. Furthermore, 5% phenol has been used in the treatment of anal pruritis, with a 92.5% success rate, the remaining patients have also been reported to be cured after a second session of administration.

The sclerotherapy has some limitations in the patients with reactive hydrocele due to malignancy, concomitant hydrocele or inguinal hernia and acute and chronic infections of testis and epididymis. Most of the previous investigators used the volume of the aspirated fluid as a guide to establish the volume of sclerosant to be instilled. Our formula was based on two factors; 1 ml sclerosant per 10 ml fluid evacuated with a maximum of 20 ml. There is no consensus in the literature about the interval between therapy sessions, ranging from one-week to 3 months. Since some reaccumulation of fluid does occur after sclerotherapy, especially within one week, re-evaluation so soon is considered of little value. In this study, the patients were called for re-examination at a 21-day period, and if there was recurrence, application was repeated. Biochemical analysis of serum and hydrocele fluid has been done as shown in Fig. 1. Hydrocele fluid is comparable to the liquid of pleural or peritoneal effusions. The fluid had significantly lower protein and lipid concentrations than the serum. Sperm cells were seen on microscopic examination of the hydrocele fluid after centrifugation. The most probable cause might be the phenomenon called evacuation atrophy. A long-standing voluminous hydrocele may lead to testicular atrophy. On the other hand, the presence of the sperm cells inside the hydrocele fluid in some patients might explain another possible immune mechanism causing infertility, which remains unknown.

In conclusion, 3% aqueous phenol sclerotherapy of hydroceles as an outpatient procedure is a highly efficient, safe and cost-effective mode of treatment. Phenol is superior to other sclerosant agents including tetracyclines, since it requires no anesthetics and antibiotics. We expect to obtain a better primary treatment outcome with 5% aqueous phenol and exclusion of the patients with inguinal operations.

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陰囊水腫に対する3％フェノールによる硬化療法の経験

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エンワー オズデミール

現在の医療においては、治療法がより非侵襲性のものへと変遷してきており、その流れの中で陰囊水腫をフェノールを用いて治療する硬化療法が見直されてきている。我々は、3％フェノールによる硬化療法を23症例の31陰囊水腫に試みた。平均3年の経過観察期間において有効率は96％であり、58％の症例において一回のフェノール療法で治癒できた。また、平均の治療回数は2.2回であった。しかし、10年前にそけいヘルニアの手術既往をもつ1症例においては7回の硬化療法後、外科的処置を要した。フェノールはテトラサイクリン等の硬液剤に比較しても優れた効果を持ち、麻酔や予防的抗菌剤の投与を必要としない。われわれの結果は、3％フェノールが陰囊水腫の硬化療法において効果を有し、経済的にも優れ安全な治療法であることを裏付けるものである。

（泌尿系要 42：427-432，1996）