History of Sclerotherapy in Urology

A brief look at the history of sclerotherapy for hydrocele and enlarged prostate

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Injection treatments are widely used in every field of medicine. Rarely is there a patient who has never had some type of injection or an intravenous access device. Yet what is so routine today had a dramatic history behind it. This is the first in a series of articles on the history of injection therapy.

INJECTION THERAPY FOR HYDROCELE

Treating hydrocele has been a concern of physicians and patients for centuries. Among the earliest descriptions of the treatment of hydrocele is that of Celsus, a Roman encyclopedist, who described the injection of the hydrocele with saltpeter (potassium nitrate) and attempts to excise part of the sac. The instrument used for the injection was not described. In 1739, the British physician Samuel Sharp reported the cure of hydrocele by injection of "Spirits of Wine" (alcohol derived from vine grapes). In this procedure, a trocar was used to puncture the skin and fluid was injected through a cannula. Sharp wrote that "the teguments were very much augmented... the inflammation terminated in a couple of abscesses which I opened and on their discharge the whole tumor subsided leaving a firm cicatrix and absolute cure of the disorder." In 1755, Donald Monro described a similar treatment performed by the army surgeon G. Monro, who also injected spirts of wine to treat hydrocele.[1]

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In 1774, the French surgeon Sabatier, researching the history for cure of hydrocele, described the technique of Majault, who injected 2 ounces of spirits of wine into the sac after emptying it. Majault allowed the injected fluid to remain in the sac for 2 minutes, then removed it via a cannula. In later procedures, he used ordinary red wine instead of spirits of wine. In 1796, James Earle, a British surgeon, used port wine, diluted with decoction (the process of boiling to extract flavor) of red rose leaves, to treat hydrocele. Two years later, Farre described his injection treatment of hydrocele. He used 7 ounces of port wine mixed with 3½ ounces of water. The injection treatment of hydrocele eventually spread to the colonies, and in 1834 Martin described a new injection therapy for cure of hydrocele using iodine.[1]

In 1835, Velpeau, in Paris, treated a man who suffered from a combined pathology of hernia and hydrocele. Velpeau made an incision down to the sac, then nicked the sac with a bistoury. While his assistant compressed the inguinal canal to prevent the injected fluid from entering the abdominal cavity, Velpeau injected a mixture containing 6 drams of tincture of iodine in 3 ounces of water and forced it into all parts of the sac. He then allowed the solution to escape. The procedure did not cure the hernia but cured the hydrocele. Discouraged by these results, Velpeau abandoned injection therapy for hernias but continued to use it successfully for hydrocele.[2,3]

In 1841, Patterson injected solution of Alum (double sulfate of

aluminum and an alkaline or ammonium) to treat hydrocele. In the following years, physicians tried several other solutions to cure hydrocele. Kress injected digitalis and described this method in 1852. In 1854, Richard, in France, described the use of alcohol and Langenbeck, from Germany, described the use of chloroform as injection solutions for treating hydrocele. In 1859 in the United States, Radley described his cure for hydrocele using hydrargyri-nitro-oxidum. Several years later, in 1866, Roges, from Buffalo, New York, treated hydrocele by injecting ammonio-ferraculum. In 1872, Levis used carbolic acid to treat hydrocele and published his results in the *Philadelphia Medical Times*. All of these solutions were very irritating, and each of these attempts produced mixed results.

Throughout the late 1800s and early 1900s, physicians continued to experiment with different injection solutions. Miller injected corrosive sublimate in 1886, and Holmes reported a radical cure of hydrocele by injection of perchloride of mercury in 1895. Dzwiewouski injected adrenalin in 1904. In 1918, Franke described injections of formalin for cure of hydrocele.

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In 1932, Killborne and Murray reported that quinine-hydrochloride 13.33% with urethane 6.66% caused no pain when used as injection therapy for hydrocele. When they compared the toxicity of this solution with that of phenol, they found that phenol was five times more toxic than quinine. The usual recommended dose of the quinine-hydrochloride/urethane solution was 2 cc to 4 cc after the sac was emptied through a large-bore needle.[4]

Four years later in 1936, Soley described good results with sodium morrhuate.[5] In contrast, Lewis reported that sodium morrhuate caused a severe anaphylactic reaction in a patient treated for varicose veins.[1] In 1935, Livermore used narrow shoestring tapes saturated with sodium morrhuate to treat hydrocele.[6] The strings were placed into the hydrocele sac after drainage and remained there. The drain was then gradually removed by shortening it. In 1938, Biederman reported treating hydrocele with Sylnasol (sodium psylliate).[7]

In the 1940s, antibiotics were introduced and used to treat the underlying cause of hydrocele (hydrocele was a common complication of syphilis and gonorrhea). Antibiotics also prevented postoperative complications, such as wound infections, as physicians turned to surgical treatment of hydrocele.

In the 1980s, interest in the injection treatment of hydrocele revived. In 1984 and 1987, Nash reported the successful use of 2.5% phenol in water. He also noted that other sclerosants, such as dextrose, phenol, glycerine solution, and 3% sodium tetradecyl sulfate (Sotradecol) solution, were recommended in the literature for treating hydrocele.[8]

In the 1980s, interest in the injection treatment of hydrocele revived.

INJECTION TREATMENT OF BENIGN PROSTATIC HYPERTROPHY AND CHRONIC PROSTATITIS

Although intraprostatic injections to treat enlarged prostate were used for many years in foreign countries, it was not until 1917 that the practice was introduced in the United States. By 1930, several articles on the subject had been published.[3] In 1933 and 1938, Grant reported on 500 patients with enlarged prostate

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treated with 1% mercurochrome injections.[9,10] With the patient under general anesthesia, he injected 2 cc to 10 cc of solution into each lobe. These injections were preceded by injections of 5 cc of solution through a fine needle into each of the surgically exposed vas. No interference with function was reported, and patients treated using this method later fathered children. In 1936, Townsend also reported on 500 patients with enlarged prostate treated with Sylnasol using the injection method. He noted that the cure obtained with this treatment was achieved faster than that with any other method.[11] Although O'Connor warned of the possibility of complications such as fibrosis,[12] Greenslade stated that risk of such complications was small.[13]

An experimental animal study of intraprostatic injections was conducted at the Mayo Clinic by Lovelace and Emmett and published in 1938.[14] They injected the prostate gland of dogs with Sylnasol and found a striking reduction in the size of the injected prostates. Some of the injected lobes decreased to one half the size of the control lobe. No urinary obstructions or retentions occurred. The glands were removed at different stages after the injections for histologic studies. Prostates removed 8 hours after the injections had small regions of necrosis; those removed 2 to 12 months after the injections had no evidence of tissue loss but a definite reduction in size.

In 1940, Riddle described a slightly different technique for injection therapy of enlarged prostate. He injected one lobe of the prostate with 5 cc of mercurochrome and exposed the vas under local anesthesia for intravasal injections. He was of a strong opinion that decompression of the prostate might be achieved with sclerosant injections. He proposed that prostatic hypertrophy was secondary to venous incompetency and stagnation of venous blood in the prostate.[3]

CONCLUSION

Today only a small group of urologists use injection therapy to treat hydrocele. Surgery is the treatment of choice for varicocele and spermatocele, while antibiotics are standard therapy for prostatitis. Benign prostatic hypertrophy is conservatively treated using transurethral cryotherapy or transurethral thermotherapy with microwaves.

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