Introduction

Female infertility caused by tubal disease comprises 25–35 % of cases [1]. The tube may be completely involved or limited to the proximal or distal end. Laparoscopic chromotubation has always been the gold standard in the diagnosis of tubal disease.

Although hysterosalpingography (HSG) is still widely used, newer modalities are emerging with more advantages. H. Pinar et al claimed that hysterosalpingosonography (HSS) with the use of contrast medium is superior to HSG and comparable to laparoscopic chromotubation in diagnosing tubal blockages [2,3]. At our center we routinely use gaseous...
spring water as contrast medium to test tubal patency. Herein we report a case previously diagnosed as an endometriotic cyst/complex tuboovarian mass which on HSS instead revealed pyosalpinx.

**Case Report**

A 30-year-old para 2 woman presented with a complaint of secondary infertility and sonographic findings of an endometriotic cyst/tuboovarian mass. Routine hysterosalpingosonography using spring water was performed to evaluate the tubal pathology. On ultrasound, we found a complex mass, predominantly cystic, measuring $9.0 \times 8.0$ cm in size in the left adnexal region, presenting mainly with an echolucent cystic mass containing internal echoes and some solid tissues at the periphery. She was then subjected to hysterosalpingosonography using spring water to test tubal patency. On instilling spring water, comet tail artifacts of micro air bubbles were traced with a transvaginal probe on screen and seen entering the left adnexal mass freely from the interstitial end and spreading throughout the mass to confirm the diagnosis of pyosalpinx depicted in Figs. 1–3 (see legend for reference). The right fallopian tube was seen with the same procedure. Diagnosis was further confirmed on laparoscopy. The entire procedure was videotaped and multiple images were taken. To our knowledge, the diagnosis of pyosalpinx has not been reported by HSS using spring water.

**Discussion**

Most of the cases of large pyosalpinx or hydrosalpinx may easily be misdiagnosed on ultrasound as a case of a tuboovarian mass; tuboovarian abscess;
endometriotic cyst; complicated ovarian cyst; or broad ligament hematomas, and then may further complicate the treatment.

Approximately 85% of tubal infertility is caused by distal tubal disease which may be due to multiple factors, such as salpingitis, antecedent elective sterilization, adhesions from previous surgery or endometriosis. Rock et al [4] classified distal tubal disease into mild, moderate, and severe categories depending on the size of the hydrosalpinx; the extent of adhesions; the degree of fimbrial preservation; and the appearance of the endosalpinx shown on hysterosalpingography (HSG).

Patients with hydrosalpinges are now taken as a subgroup having a significantly impaired pregnancy outcome as compared with patients suffering from other types of tubal damage. Data from meta-analyses of large retrospective studies demonstrated that in women with hydrosalpinges, their clinical pregnancy, implantation and delivery rates are reduced by half and spontaneous abortion rates double as compared with patients having other causes of tubal infertility after invitro fertilization – embryo transfer (IVF-ET) [5,6].

Although hydrosalpingeal fluid does not have direct toxic effect on human embryos [1,2], it is found to interfere with the development of embryos due to its deficiencies in essential nutrients and energy stores [7,8]. In addition, the leakage of hydrosalpingeal fluid into the uterine cavity compromises implantation by altering endometrial receptivity, as well as by mechanically washing the blastocyst away from the endometrial surface [9–13].

From the abovementioned facts, it can be well understood that early diagnosis and treatment is critically important in terms of later pregnancy outcomes when managing either pyosalpinx or hydrosalpinx. If they are misdiagnosed as a endometriotic cyst or a tuboovarian mass, one may delay proper treatment and subject patients to unnecessary exposure to other drugs which may aggravate the disease.

The ideal procedure should have a high rate of success, be safe and easy to perform, be well accepted by the patient and be inexpensive [4]. Hysterosalpingosonography using spring water has all these advantages over other diagnostic procedures as it does not require any hospital stay, does not expose subjects to fluoroscopic material which could result in allergic reactions, is less time consuming (3-10 minutes), and it can be repeated in the next cycle. In underdeveloped countries laparoscopic diagnosis is very costly and rarely opted for when diagnosing hydrosalpinx/pyosalpinx. In view of all this, HSS can be used as the first line confirmatory test for hydrosalpinx.

Treatment options for hydrosalpinx include drainage, salpingostomy, proximal tubal ligation, and salpingectomy [12]. With proven benefits of salpingectomy shown by many retrospective reports, two small randomized clinical trials [13] and one multicenter prospective randomized clinical trial done by Strandell et al [14] address the role of laparoscopic salpingectomy versus no treatment for hydrosalpinx prior to in vitro fertilization (IVF), all concluded that the pregnancy and delivery rates increased by 13% in the salpingectomy group compared with non-intervention group. Meta-analysis done by Johnson et al [15] concluded the same viewpoints and suggested laparoscopic salpingectomy should be considered in patients with hydrosalpinges who planned to undergo IVF program.

Thus it can be recommended that all adnexal complex masses resembling tuboovarian masses or endometriotic cysts be further subjected to hysterosalpingosonography with spring water as these can be easily missed on routine sonography and the diagnosis can totally change the management.

References


