INTERVIEW REPORT

Supporting advances in gynecologic oncology

Introduction

Professor Antonia Testa is one of Europe's leading experts in gynecologic oncology and has conducted more than fifty research projects on gynecological cancer and chemotherapy protocols. She also founded a world-class school for ultrasound in gynecology in Rome, Italy, that has trained thousands of specialists since its inception. Professor Testa is a board member of the International Ovarian Tumor Analysis group (IOTA). Her overall work has contributed to improve early and confident diagnosis in gynecological disease. In this report Professor Testa explains how important Canon's ultrasound systems are in her daily clinical practice and research.

Throughout her career, Prof. Testa has completed pioneering research and advanced gynecology with the help of ultrasound. She graduated in Medicine at the Catholic University in Rome (Italy) and is now Associate Professor of the Institute of Obstetric and Gynecological Clinics at the Catholic University of the Sacred Heart in Rome, Italy and Scientific Director of the Center for Ultrasound in Gynecological Oncology "Class Ultrasound" of the Fondazione Policlinico Agostino Gemelli IRCCS, Rome.

She has been a Board member of the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) for eight years, and Vice-President of the Italian Society of Gynecology and Obstetrics (SIGO Federation) for two years. Prof. Testa is member of the Steering Committee of International Ovarian Tumor Analysis (IOTA) group.

Ultrasound in research and daily practice

"My story changed significantly in the year 2000, when I met Professor Lil Valentin (Lund University, Sweden), Professor Tom Bourne (Imperial College, London, UK) and Professor Dirk Timmerman (KU Leuven, Belgium). Together with them, I started an adventure that is the International Ovarian Tumor Analysis group (IOTA)" she explained. "We started to prospectively collect data of ultrasound and histology, of patients with ovarian masses and developed mathematical models, like simple rules and ADNEX, to discriminate between benign and malignant ovarian masses. So far, our database includes more than 25,000 cases."

Prof. Testa has been working with ultrasound engineers to develop new softwares and algorithms to improve the clinical management of patients with gynecological disease. In particular, she has contributed for the integration of IOTA predictive model (ADNEX model) into ultrasound equipment for discrimination between benign and malignant ovarian masses, which is integrated into the Aplio series.

IOTA-ADNEX model in case of advanced stage Ovarian Cancer.

Ovarian Cancer.

Ovarian Fibroma with flow visualized by Superb Micro-vascular Imaging (SMI).

"In addition, through working as part of the gynecology team, I realized the great value of ultrasound in the daily clinical management of our patients. In particular, during follow-up, when we can use ultrasound as a bedside tool.

For example, if we have a suspicion of a recurrence, we can check it immediately to understand the nature of one or more lesions and assess the possibility to surgically remove the lesion. In addition we can obtain a biopsy of that lesion to follow up the situation during treatment," she continued.

"I wanted to share my knowledge with my colleagues, with residents and with students, which is why I created the Center for Ultrasound in Gynecological Oncology "Class Ultrasound" at the Agostino Gemelli University Hospital Foundation in Rome, Italy. Since its inception six years ago, around 2,500 colleagues have attended courses there." The Center has trained Italian and European physicians and health professionals, provides patients with the highest professional service and plays a key role in multi-center scientific studies.

Celebrating five years of scientific collaboration

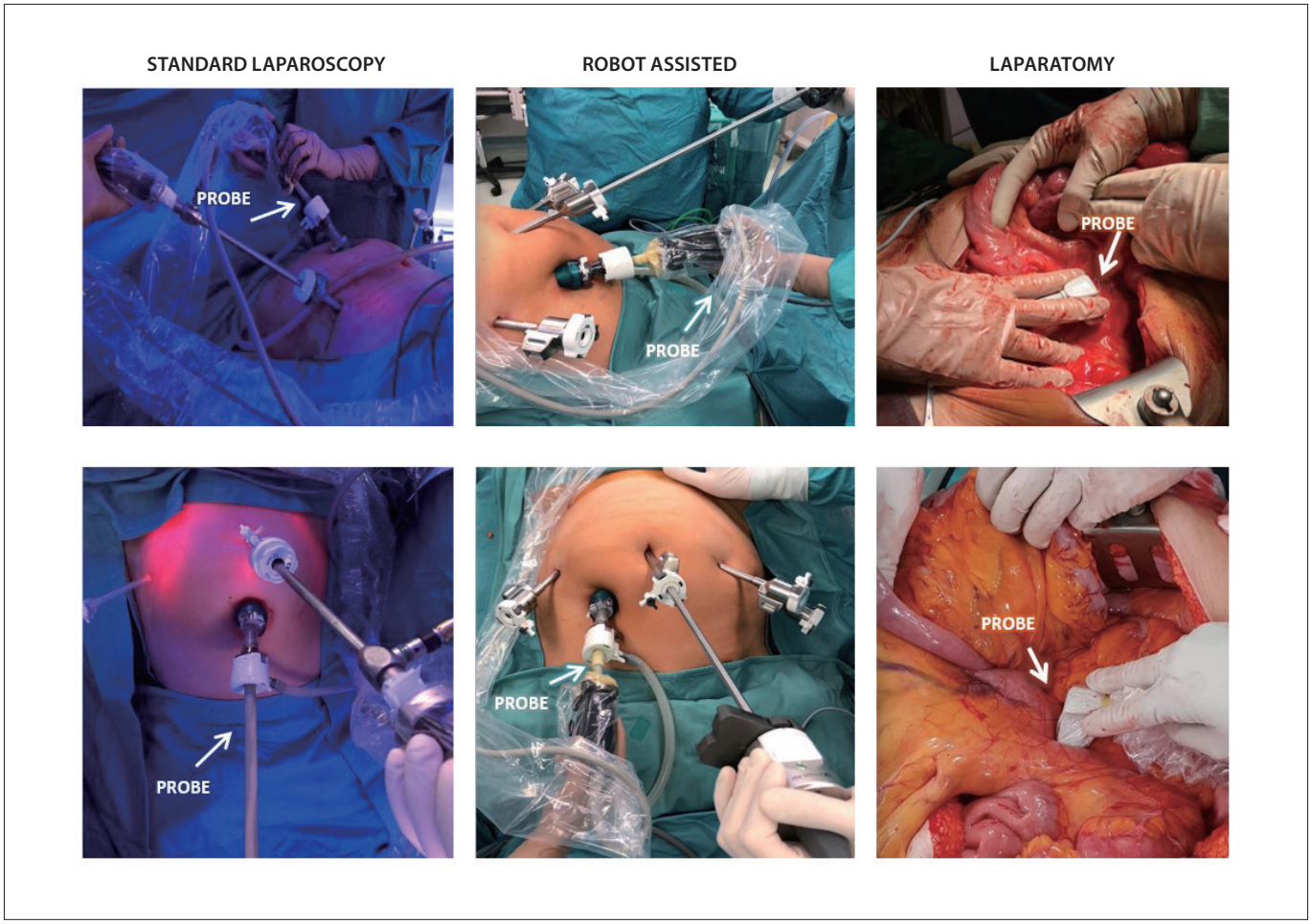
This year marks the fifth anniversary of a collaboration with Canon Medical Systems that has brought great results for Prof. Testa's research and clinical practice, and has helped Canon to advance its ultrasound systems.

"My story with Canon Medical Systems started in 2016 after ISUOG World Congress, which I had the honor to organize. Canon professionals offered me the opportunity to begin a scientific collaboration.

As I am always looking for something innovative, I was very happy with their proposal to explore new software and new ultrasound equipment."

Prof. Antonia Testa

Associate Professor of the Institute of Obstetric and Gynecological Clinics at the Catholic University of the Sacred Heart in Rome, Italy and Scientific Director of the Center for Ultrasound in Gynecological Oncology "Class Ultrasound" of the Fondazione Policlinico Agostino Gemelli IRCCS, Rome.



Laparoscopic and intraoperative surgery.

The Aplio i700 Women's Health system

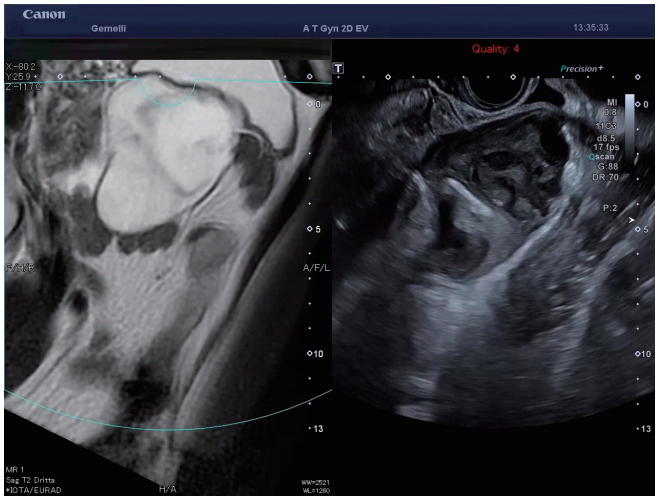
Prof. Testa started to work with Canon's Aplio i900 ultrasound system at the beginning of the collaboration, which was later exchanged for a dedicated Aplio i700 Women's Health system when it became available. The School of Ultrasound also have a smaller Canon Xario 200G for evaluation in their surgery department with intraoperative and laparoscopic transducers. Initially, they used the Aplio for this functionality, but instead of moving the system between departments, the Xario 200G was made continuously available in the surgery department. With its smaller footprint, little space was required. Because it runs on batteries, it offers optimal mobility.

"The most important requirements relating to an ultrasound system that I am always looking for are first - resolution, so high-quality grayscale images. Then, intuitive software, that allows the examiners to use the equipment at its best. In other words, easy-to-manage tools that are not very complicated to use. Then, high-quality vascularization assessment," she continued. "When I discovered Aplio ultrasound machines, I was fascinated by its very high image quality with crystal-clear images and enhanced penetration. Then I found the equipment very good, able to deliver superb images for a wide range of clinical applications. Moreover, regarding the vascularization, it was amazing to find that the machine had the possibility to detect very, very small vessels, which is crucial for us to discriminate papillary projections or amorphous material, for instance, within an ovarian cyst. I have to say that also the Doppler Luminance is fantastic, because it gives the impression of 3D rendering images."

Meeting challenges

"In gynecologic oncology there are several challenges for the management of our patients. First, pre-operative assessment: to detect a lesion and to be able to discriminate between benign and malignant; Furthermore to stage cancer, that means not only to see the lesion, not only to understand that it can be malignant, but to assess the extent of the disease. We know that the trans- vaginal ultrasound examination is fundamental and superior to other sophisticated imaging methods, because of the dynamic examination. It offers the possibility to check the reciprocal movements of other organs, to check for pain, while pushing against the organ, and to assess the deformability of the organ… these are of upmost importance in the examination of the pelvis."

"Secondly, the challenge is to have a bedside tool to get a quick assessment to solve some clinical problems, to check for pleural effusion and presence of ascites or do simple procedures, such as paracentesis, drainage of fluid or place intraperitoneal catheters. And thirdly, we discovered that ultrasound can play an important role in the surgical field. As our patients very often had been already treated with radiotherapy, and/or previous surgical procedures, sometimes, it's very challenging to detect a small recurrent lesion located in the lower part of the pelvis, for example. With the transvaginal transducer, we can guide the surgeon to reach that small area. Besides that, Canon provided us with a laparoscopic ultrasound transducer, and this is fantastic, because for some patients with borderline ovarian tumors, for instance, we are able to provide 'fertility-saving' surgery. We can select the area and localize the small lesion in order to spare the largest amount of normal tissue."



Smart Fusion Image of Low-Grade Appendiceal Mucinous Neoplasm.

New research possibilities

The systems have also enabled new possibilities in research. "As far as innovation is concerned, I was very interested in the possibility to explore Smart Fusion that fuses Ultrasound with MR or CT images. So, we decided to run a prospective study on patients with cervical cancer and a study in patients with advanced ovarian cancer. We have already published the results on the first study - cervical cancer. We have been analyzing data of a large series of patients with ovarian cancer," said Prof. Testa. "At the moment, I can say that I'm very happy about this experience and, in my opinion, Smart Fusion can play a prominent role in education. To have the possibility to share the experience, being the radiologist and gynecologist together the same room - It's very important for the improvement of the experience of both disciplines."

Working on the future

Canon continuously develops its ultrasound systems to provide even better image quality and workflow that enable clinicians to advance medicine. One important aspect is integrating Artificial Intelligence (AI) enabled technologies into the ultrasound systems in the future.

"I look confidently towards the future," added Prof. Testa. "I really hope that ultrasound equipment will provide us with Artificial Intelligence analysis. With this, we will be able to store a lot of images using a simple method plus define and recognize more of what we cannot do with our eyes and brains."

Prof. Antonia Testa

Acknowledgement:

This article is a reprint from the international VISIONS magazine #37, published by Canon Medical Systems Europe B.V.

Publications:

1 Intraoperative ultrasound diagnosis of metastatic lymph node in serous borderline ovarian tumor
De Blasis I, Tortorella L, Macchi C, Arciuolo D, Scambia G, Testa AC (UOG 2019).

2 Ultrasound Technologies in the diagnosis and treatment of ovarian cancer
Antonia Testa, Canon webinar at ISUOG World Congress 2020.

3 Fusion imaging of ultrasound and MRI in the assessment of locally advanced cervical cancer: a prospective study
Moro F, Gui B, Arciuolo D, Bertoldo V, Borzi R, Romeo P, Petta F, Cambi F, Pasciuto T, Zannoni GF, Valentini V, Manfredi R, Scambia G, Testa AC Italy (IJGC 2019).

CANON MEDICAL SYSTEMS CORPORATION
https://global.medical.canon

Model number: TUS-AI700, CUS-X200G
MOIUS0128EA 2021-11 CMSC/Produced in Japan

Canon Medical Systems Corporation meets internationally recognized standards for Quality Management System ISO 9001, ISO 13485. Canon Medical Systems Corporation meets the Environmental Management System standard ISO 14001.

The clinical results described in this paper are the experience of the author.
Results may vary due to clinical setting, patient presentation and other factors.

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