



ENHANCING PRECISION GROWING PATIENT VOLUME FIGHTING A GROWING PUBLIC HEALTH THREAT

How the Fundacion de Cancer de Mama (FUCAM) is using the TomoTherapy® System to provide critical breast cancer treatment to underserved populations

EXECUTIVE SUMMARY

The Fundacion de Cancer de Mama (FUCAM) is a first-of-its kind non-profit institution focused on fighting the rising rates of breast cancer among Mexican women by delivering screening and treatment to underserved populations. To treat its high proportion of complex cases, FUCAM recognized the need for a radiation therapy solution capable of delivering extremely precise treatments. FUCAM's high patient volume required that the right solution needed deliver added precision without sacrificing treatment efficiency. TomoTherapy was an early frontrunner, based on its excellent reputation within Mexico's small community of radiation oncologists. After seeing the next-generation TomoTherapy System in action at the 2013 ASTRO conference, FUCAM staff recognized the streamlined, efficient treatment planning and delivery was an ideal fit for their needs. Speedy deployment saw patient load ramp up to full volume in just three weeks, and the impacts were immediate. The comfortable, approachable TomoTherapy treatment delivery gantry is providing an improved patient experience and reducing patient anxieties. Faster treatment planning and delivery — for both complex and simple cases — has FUCAM on track to double its previous patient volume. The TomoTherapy System is helping FUCAM further its mission, extending its ability to provide critical breast cancer treatment to more patients in need.

A Growing Public Health Threat

Following the global trend, cancer rates in Mexico continue to rise — and breast cancer is now the number-one killer of Mexican women. Unfortunately, only around half of Mexican women have access to mammography screening, and 1 in 4 women are diagnosed at advanced stages of breast cancer. Extending screening is a critical first step to reducing breast cancer deaths. But with fewer than 250 radiation oncologists for its 100 million-plus population, high patient volume is a challenge for all Mexico cancer treatment facilities.

First-Of-Its-Kind Breast Cancer Treatment Center

To address the growing public health threat posed by breast cancer, in 2008 the Mexican government helped launch a new non-profit institution dedicated exclusively on breast cancer. The Fundacion de Cancer de Mama (FUCAM), in Mexico City, is the first of its kind in both Mexico and throughout Latin America. FUCAM gives particular focus to reaching those most vulnerable and marginalized populations of women in Mexico, providing screening, diagnosis and a wide range of treatments for breast cancer, as well as promoting public education about the importance of early detection.

FUCAM's six mobile units connect with women around the country, providing screening and referring women to its central operations for treatment. This drives a huge daily patient volume at FUCAM. The center provides around 100 medical consultations, 70 mammograms, 75 breast ultrasounds, 40 surgeries and nearly 50 radiation therapy treatments every day.

Complex Cases Create Need for New Precision Treatment Solution

Because of the high percentage of late-stage diagnoses, 1 in 5 treatment cases at FUCAM are highly complex, including bilateral breast cancer and palliative cases where patients have lesions in the central nervous system, spine, pelvis and other complicated areas. Because of this complexity, "We obviously have the need for a precise system that allows us to do very detailed planning," said Dr. Judith Huerta Bahena, head of radiotherapy, Institute of Diseases of the Breast, FUCAM.

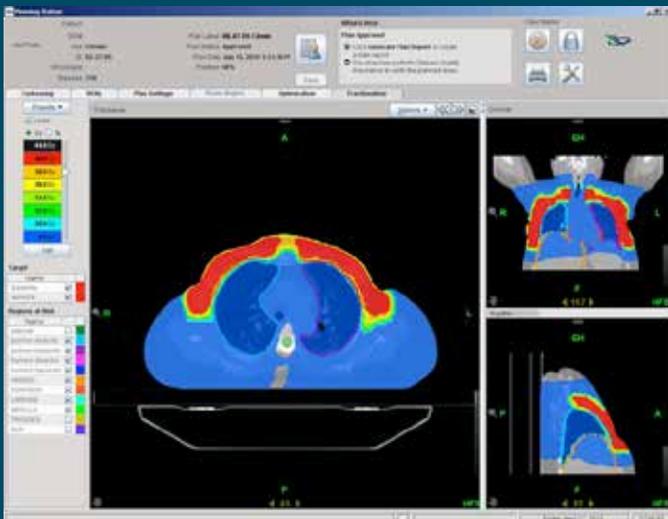
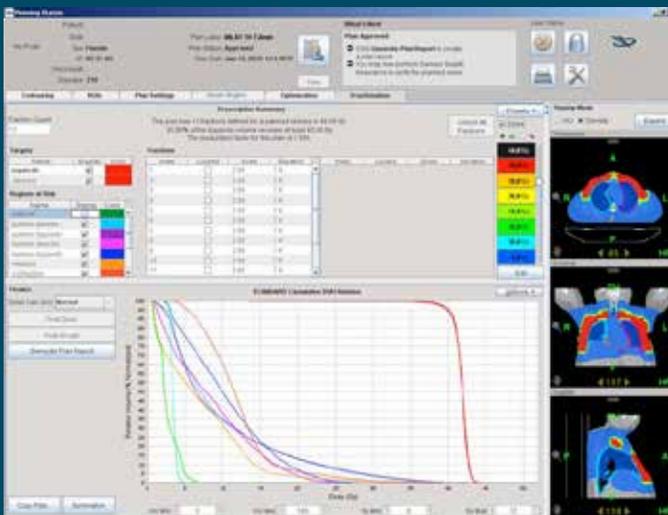
CASE STUDIES IN PRECISE AND EFFICIENT TREATMENT PLANNING

FUCAM TomoTherapy® Treatment Plans

Patient: Female, 51 years

Past medical history: Hypertension under medical treatment

Diagnosis: Patient detected a left breast lump and the imaging of both breast showed abnormal mammography in both sides, so she was submitted to fine needle aspiration biopsy that confirmed infiltrating ductal carcinoma of the right side and invasive lobular carcinoma of the left side. The patient was diagnosed with a bilateral synchronous breast cancer right side stage T2N1M0 and left side stage T3N1M0. Her cancer was treated with a bilateral modified radical mastectomy and with anthracycline-based and taxane-based multiagent chemotherapy, 6 cycles. The biological subtypes of both cancers based on ER, PR and Her2Neu status was Luminal A and after the chemotherapy she started treatment with Anastrozole. We planned post mastectomy radiotherapy for both chest walls and the supraclavicular lymph node areas. The dose was 40Gy in 15 fractions



Treatment notes: The patient tolerated the treatment well, presenting G1 radiodermatitis.

In 2014, FUCAM began looking to invest in new radiation therapy to deliver this precise treatment capability.

"We needed high-quality technology that could deliver conventional radiation therapy in addition to extreme hypo-fractionation...to address a variety of patient needs," said Dr. Huerta.

Top Priority: High-Volume Efficiency

The ability to handle FUCAM's high patient volume was a top priority. "We are a reference center for breast cancer patients, receiving about 1,000 new cases per year," said Dr. Huerta, "So it was critical that we select a versatile and efficient radiation therapy system" that yielded lower treatment planning and treatment delivery times.

The Clear Solution Emerges

Though FUCAM considered a wide range of solutions from leading technology providers, the TomoTherapy System's strong reputation in Mexico's small radiation oncologist community made it a frontrunner from the start. Dr. Huerta had seen the TomoTherapy System in use in other clinical environments, but though she recalls being impressed by its treatment capabilities, she was underwhelmed with the previous-generation system's time-consuming treatment planning requirements. However, after seeing the new-and-improved TomoTherapy System while attending the 2013 ASTRO meetings and SRS Congress in Minneapolis, Minn., the dramatic improvements made a big impression on Dr. Huerta. The next-generation system delivered an even greater level of precision — but treatment planning was now streamlined and simplified to the point that the TomoTherapy System was faster than its competitors.

Convinced that the technology could not only meet precise treatment needs, but also enable faster treatment planning and treatment delivery that would expand patient volume, FUCAM chose to deploy the TomoTherapy System.

Patient Volume Ramps Up Quickly

FUCAM deployed the TomoTherapy System at the end of 2014. The institution immediately began leveraging the technology for treatment planning. "We were able to start treatment planning even before we had permits to begin treatment," said Dr. Huerta. This enabled quick ramp-up of treatment volume, as FUCAM went from treating 15 patients in its first week with the TomoTherapy System up to a full schedule of 40+ patients/day by just the third week.

FUCAM uses both the TomoHelical™ and TomoDirect™ Delivery Modes. Parameters established by FUCAM dosimetrists define maximum doses and help define which delivery mode is optimal per patient case. "If [we] can do it with TomoDirect, that will be our first option; if not, we will use TomoHelical," Dr. Huerta said.

CUSTOMER PROFILE | FUCAM

As of March 2015, FUCAM was averaging treatment of 46 patients every day, and had already treated nearly 300 patients through the public system, in addition to private patients.

FUCAM staff was extremely pleased with the implementation experience with the TomoTherapy® System. Though the inevitable bumps in the road emerged, “we are very satisfied with Accuray Incorporated’s service,” said Dr. Huerta. Solid clinician training played a key role in speeding deployment. “Accuray provided effective learning tools,” Dr. Huerta said, adding that speaking with peers experienced in using the TomoTherapy System provided further guidance.

Efficient Planning Increases Patient Volume

The TomoTherapy System is improving clinical outcomes at FUCAM, driving patient volume. “The advantage that I see with the TomoTherapy System is that planning is very friendly, simple and fast compared to other systems,” said Dr. Huerta. This faster planning complements the TomoTherapy System’s highly efficient treatment delivery, enabling FUCAM to treat more patients in less time. Patient treatment slots at FUCAM are now just eight minutes long, with the simplest cases treated in half that time. The efficient planning and treatment delivery of the TomoTherapy System will enable FUCAM to treat nearly twice as many patients as it did before deploying the solution.

Comfortable Equipment Improves Patient Experience

The TomoTherapy System is also enhancing patient experiences at FUCAM. Dr. Huerta notes that patient positioning is easier and more comfortable with the new technology. Patients immediately recognize the comfort, and experience fewer issues with claustrophobia or other treatment anxieties.

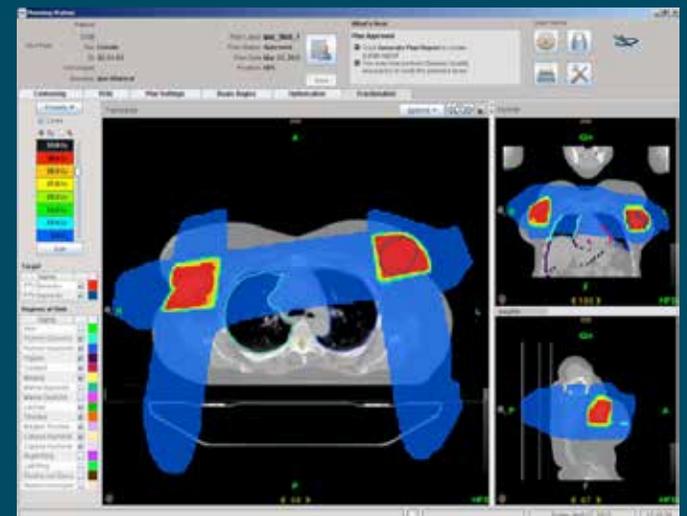
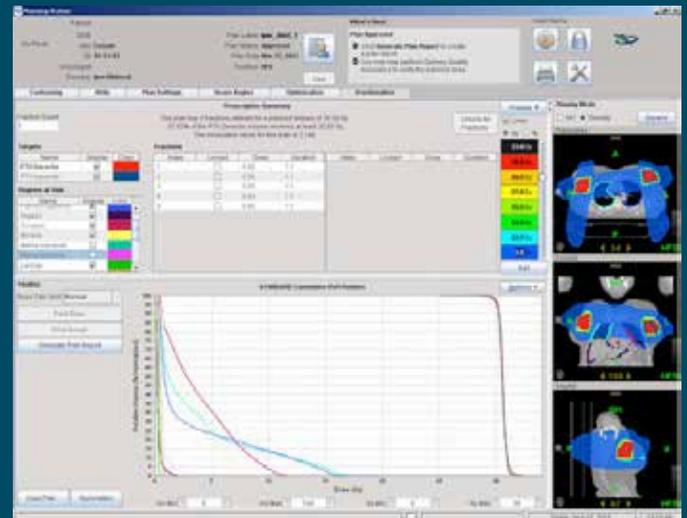
Many patients still arrive with treatment anxieties, but “once they see the equipment and how other patients come out of the treatment, they become excited, they get treated, and they are very satisfied,” said Dr. Huerta. In fact, since deploying the TomoTherapy System, FUCAM has not had a single patient refuse treatment based on such anxieties. Patients from other facilities are now requesting treatment at FUCAM, as word of the TomoTherapy System’s comfort has spread quickly within the patient community.

Patient: Female, 60 years

Past medical history: None

Diagnosis: This asymptomatic patient was submitted to a screening mammography which showed an abnormal finding in the upper external quadrant of the right breast and also in the per areolar region of the left side. A stereotactic-guided bilateral biopsy confirms bilateral ductal carcinoma in situ. The patient was submitted to bilateral lumpectomy and sentinel axillary lymph node sampling and according to the size of the lesion (1.5cm) a partial breast irradiation was proposed as treatment to both breasts. The biological subtypes of both cancers based on ER, PR and Her2Neu status was Luminal B. She accepted the treatment and a dose of 30Gy in 5 consecutive fractions were prescribed to the lumpectomy cavity based on the mammography findings.

TomoTherapy treatment plan and dosimetry:



A Clear Business Impact — a Satisfied Customer

The clinical and business impact of the TomoTherapy® System is unmistakable for FUCAM. Dr. Huerta was confident in the potential of the TomoTherapy System to increase patient volume, but said “we are actually doing better than what we planned for.” Before installation, FUCAM was treating around 500 patients annually. The institution estimates that treatment volume will surpass 1000 patients for 2015 — nearly doubling their previous volume and exceeding their initial goal by 50 percent.

This immediate and definitive impact brings a resounding endorsement from Dr. Huerta and the FUCAM team: “We are very satisfied with the system,” she said, “This is a technology that I absolutely recommend.”

Patient: Male, 83 years

Past medical history: Positive smoke and alcoholism, denies others.

Diagnosis: Three months ago this patient presented proptosis of the left eye leading to ocular irradiation and inflammation. An ophthalmologist proceeded to a biopsy of the lesion causing exophthalmos, the pathology describes an Intermediate B-cell lymphoma (DLBCL) and the workup with labs, CT and bone marrow biopsy confirms a limited stage I, no B symptoms and with disease limited to the orbit.

He received local treatment with radiotherapy using a hypofractionated schedule equivalent to 40Gy (37.5Gy in 15 fractions).

TomoTherapy treatment plan and dosimetry:

