

# LIFE & ARTS

HEALTH

## If Surgery Got Cancer in One Try

The MarginProbe device is helping some breast-cancer surgeons achieve 'clean margins' and reduce follow-up operations



CLOCKWISE FROM LEFT: UC IRVINE HEALTH; ADAM WATT/NYU LANGONE MEDICAL CENTER; LORA MOSCA

BY LUCETTE LAGNADO



A NEW DEVICE may hold the promise of eliminating an anguishing part of many breast-cancer surgeries: a follow-up operation to remove lingering cancer cells. Several surgeons are using a tool that shows promise in reducing the number of repeat procedures. Freya Schnabel, director of breast surgery at NYU Langone's Perlmutter Cancer Center, says the device, which allows a surgeon to check for malignant cells and remove them immediately, could make breast-cancer surgery far more efficient and effective.

The tool that Dr. Schnabel and her colleagues have embraced is the MarginProbe—a hand-held gadget the size of a thick pen with which surgeons explore around the edges of cancerous tissue they have removed. When it spots a cancerous area, the device emits a red light and a loud beep, prompting the surgeon to remove more tissue. If the area is clear of malignant cells, the MarginProbe flashes a blue light along with a different, less-jarring sound.

Surgeons strive for “clean margins” when removing a breast tumor. That means not simply taking out the tumor but ensuring that a small area of tissue around it is healthy. Although what constitutes a healthy margin has been the subject of debate, with shifting definitions, typically it has been one or two millimeters, especially with certain non-palpable cancers. That procedure, called a “lumpectomy,” has long been the gold standard of surgical breast-cancer care, as it

eliminates the tumor while preserving the breast.

Obtaining clean margins is critical to the procedure's efficacy. The likelihood of cancer recurring has been found to be twice as high when doctors fail to achieve adequate margins—hence the need for patients to return to the operating table.

Still, some breast surgeons worry that re-excision rates are too high. Dr. Schnabel estimates they are as much as 20% to 30% nationally. “You need to be able to say to the patient, ‘One outpatient surgery and you are done,’” she says. A 26-year veteran of breast surgery, she hates telling patients she failed to achieve a clean margin. “I find it a very upsetting conversation,” she says, noting that a patient could feel so discouraged she opts for a mastectomy—the removal of her breast altogether—out of fear or frustration.

Viewing low re-excision rates as

The MarginProbe, top left, is a tool that breast surgeons say may reduce the number of second surgeries to remove any remaining cancerous cells. Above, Dr. Freya Schnabel, whose patients include Lora Mosca, left, uses a MarginProbe.

a key indicator of quality, other institutions are highlighting their techniques to reduce second surgeries. At Mayo Clinic in Rochester, Minn., breast surgeons point to their method of having pathologists nearby in the operating suite

to examine frozen tissue samples while the patient is in surgery. Their second-surgery rates are 3.6%, though the technique is a century old, says Dr. Judy Boughey, Mayo's surgical-research chair.

In a randomized trial involving 596 patients in 21 institutions in America and Israel, Dr. Schnabel found that the MarginProbe reduced the numbers of patients requiring second surgeries by 26%.

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MOVIES

## NO NEED FOR DUBBING, JUST TRY AN APP

BY ERICH SCHWARTZEL

sence from Harvard in 2013 to found the

### The WSJ Daily Crossword | Edited by Mike Shenk

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LIFE & ARTS



Kristine Opolais in the title role of Dvorák's 'Rusalka'

OPERA REVIEW

Chilly Fairy-Tale Romanticism

BY HEIDI WALESON

New York

MARY ZIMMERMAN'S handsome new production of Dvorák's "Rusalka," which had its premiere at the Metropolitan Opera on Thursday, peeks beneath the opera's fairy-tale Romanticism, Bruno Bettelheim-style. The structure and storytelling are clear; missing is the pathos of the water nymph who gives up everything for a mortal Prince. In Jaroslav Kvapil's libretto, Rusalka is characterized as pale, cold and bloodless, like water, even as the heart-breaking music conveys her deep yearning. Ms. Zimmerman's concept, as executed by soprano Kristine Opolais, takes that coldness a bit too literally.

This Rusalka is always "the other"—physically awkward even in the forest, her natural habitat, and hesitant in the human realm after she has been transformed by the witch Jezibaba (Jamie Barton). The source of her uncertainty and fear becomes clear in Act II: Her adolescent fantasy has thrown her into the world of grown-up sexuality. "I am only half a woman," she sings. Ms. Zimmerman and her designers (Daniel Ostling, sets, and T.J. Gerckens, lighting) create that dynamic with taste and subtlety, starting with Act I's pretty wallpaper forest, huge twisted tree, and the giant moon that rises and flies away. This Romantic natural world is replaced in Act II by a red ballroom. In Act III, when Rusalka returns, betrayed, to the forest, it is ripped and dead, the set's supports and riggings visible.

Also key is Austin McCormick's trenchant choreography, contrasting the childish playfulness of the wood sprites in Act I with the ferocious ballet of Act II, in which the Prince's party guests enact the many levels of male-female relationships, terrifying Rusalka. Mara Blumenfeld's dramatic costumes do the same, the sprites looking like 18th-century girls playing dress-up in their mothers' underwear, while the Foreign Princess (Katarina Dalayman), who seduces the Prince away from Rusalka, sports a huge red-and-gold dress and spiky tiara.

Conductor Mark Elder and the Met orchestra got to the core of Rusalka's tragedy in a luminous performance that captured the moonlit fantasy, the folkloric humor and the crushing weight of disappointment in this gorgeous score, but Ms. Opolais never touched the heart. Her singing was elegant and cool; you didn't hear the yearning beneath her "Song to the Moon." She was most persuasive when she could unleash her power, but Rusalka's vulnerability, which makes her more "human" than the mortals, was missing. In the poignant final scene, it was Brandon Jovanovich's Prince who won your sympathy. After spending the entire evening as a sexual predator, his tenor aggressive with a manner to match, he softened and melted, begging for the deathly kiss of the wraith he has created.

Ms. Waleson writes about opera for the Wall Street Journal.

Rusalka  
The Metropolitan Opera, through March 2

KEN HOWARD/METROPOLITAN OPERA

MARGIN

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Her findings were published in the Annals of Surgical Oncology in 2014. The trial was funded by the company that makes MarginProbe as part of the F.D.A. approval process so the device could be marketed and sold in America. Dr. Schnabel has received no speaking fees from the company.

In her department at NYU, Dr. Schnabel says, re-excision rates have dropped to 11% from 24% in cases where MarginProbe was used, according to a presentation she is making in the spring at the Quality Care Symposium of ASCO, the American Society of Clinical Oncology. The maker of MarginProbe had no financial role in the research, which was based on internal NYU data, Dr. Schnabel said.

Recently, an Iowa surgeon who performed a retrospective analysis of two sets of lumpectomy cases—one group of 137 cases where MarginProbe was used and another, involving 199 cases, where it wasn't—found 57% fewer re-excisions in cases involving MarginProbe, according to a December 2016 paper in the American Journal of Surgery. The makers of MarginProbe had no financial role in the study.

Vincent Reid, the study's lead author, and medical director and surgeon at the Hall-Perrine Cancer Center at Mercy Medical Center in Cedar Rapids, said when he first heard about the device, "It sounded too good to be true." And there was a learning curve until he felt comfortable with it. "The more I used it, the more I trusted the technology," he says, estimating it adds 10 to 15 minutes to his surgery. Dr. Reid says he has received speaking fees from the makers of MarginProbe.

Even the device's advocates acknowledge its flaws. Dr. Schnabel says the MarginProbe is so sensitive it gives many "false positives"—indicating cancer where there isn't any, and prompting surgeons to take out extra tissue. Yet the reverse, she says—missing cancerous spots—would be far more consequential.

MarginProbe, which is made by Dune Medical Devices, a privately held company with offices in Pennsylvania and Israel, was developed by an Israeli physicist. It operates on the notion that cancerous cells are different from healthy ones, and have their own electromagnetic properties that can be detected using radio-frequency spectroscopy.



Dr. Vincent Reid analyzed use of the MarginProbe.

Getting a handle on a formidable malady

252,710 new cases

of invasive breast cancer are expected in women in the U.S. in 2017, along with 63,410 new cases of non-invasive breast cancer

20%-30% of women

who have lumpectomies to remove a cancerous lesion must return to have a second surgery

35% of follow-up

breast-cancer surgeries to remove leftover malignant cells result in complications

\$9,000-\$16,000

or more is how much each second breast-cancer 're-excision' surgery can cost

Sources: Susan G. Komen Foundation, Annals of Surgical Oncology, ASCO abstracts, Dr. Alice Police

which is being used in about 100 medical centers around the U.S., remains a stumbling block. Each breast surgery requires a new MarginProbe, at \$1,000 each, which isn't typically covered by insurance. "The problem is paying for the device," says Alice Police, a cancer surgeon who uses the MarginProbe in her work at UC Irvine Health Pacific Breast Care Center, in Costa Mesa, Calif. Dr. Police has received speaking fees from Dune Medical Devices, she said. Second surgeries cost a lot more—\$9,000 to \$16,000 and up—but hospitals and surgery centers are reimbursed for them. Dr. Police says health-care economics have created a strange incentive favoring re-excisions, no matter the costs to the health system. She credits the device for lowering her re-excision rate to 3% from 15%. But she worries about hospitals balking: "You have to tell a hospital, it is going to cost you \$1,000 and we are going to take away your second operation."

One of Dr. Schnabel's patients, Lora Mosca, learned she had breast cancer in November and decided on a lumpectomy to remove an early-stage tumor. Ms. Mosca, a 57-year-old retired probation officer, remembers how worried she was after surgery. "That is all you think about—did they get it all out?" she says. She found herself wondering, "Should I have had them take the whole breast?" Dr. Schnabel was reassuring; she had used MarginProbe, and the margins turned out clean.

Amber Guth, professor of surgery at NYU Langone, says she uses MarginProbe in all her surgeries. The device helps, she says, because "it slows us down a bit and makes us look very carefully at the specimen." And she doesn't mind the beeps. "I am in Manhattan, I am used to noise," Dr. Guth says, though it is a lot nicer when the probe spots an area without cancer. "There is a more pleasant tone when it is blue."

copy. The company is testing the device on prostate cancer and believes the technology can be applied to other cancers, according to Lori Chmura, Dune's chief executive. Studies have shown the device reduced re-excisions by 50% or more, Ms. Chmura said. The cost of the device,



Dr. Schnabel uses the MarginProbe to check a specimen for 'clean margins.' She says it has helped reduce re-excision rates.

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