Commentary on "Surgery for Breast Cancer"

Global health is not a one-way flow of traffic with expertise and knowledge traveling just from the developed world to low- and middle-income countries. Rather, from the introduction of exercise parks for older people (a Chinese practice) into Western communities to a radical rethinking of the nature of dementia inspired by perspectives from developing countries (the 10/66 project),[1] *mutual* exchanges are rich and numerous.

Perhaps surprisingly to many of us in the West, some of the techniques that we ascribe to the post-Enlightenment science of the Western world may actually have been anticipated in cultures that, in our hubris, we consider to be less sophisticated.

The beautiful Japanese woodcarving "Surgery for Breast Cancer" is a potent reminder that a Japanese surgeon described general anesthesia almost four decades before Crawford Long, to whom the discovery of anesthesia is usually credited. The illustration is part of a 10-volume treatise on surgery by Kamata Keishu; much of it is a homage to his remarkable mentor and teacher, Hanaoka Seishū (1760–1835).

Hanaoka was an extraordinary surgeon who lived and practiced near Osaka, Japan. Despite Japan's isolation from the West from 1633 to 1853, he combined knowledge of scarce Dutch medical texts with both Chinese and Japanese medicine to develop a repertoire of innovative surgery, including osteotomies, mastectomies, and plastic surgery, paralleled only by the achievements of Theodor Billroth half a century later.[2]

Hanaoka's most major innovation was that of a chemical anesthetic based on a herbal mix, called *Tsusen san*, which caused sedation and the relaxation of skeletal muscle. The active ingredients are now known to include scopolamine, hyoscyamine, atropine, aconitine, and angelicotoxin. The first documented case of Hanaoka's use of *Tsusen san* was for a lumpectomy he performed in 1804, as illustrated in the woodcarving.

Speculating that this form of anesthesia may have an even longer pedigree based in non-Western traditions is intriguing: A tantalizing description of a similar anesthetic mixture, called *mafeisan*, appears in descriptions of the practice of Hua Tuo, a Chinese surgeon who lived in the second century AD.[3] However, the influence of Confucianism, which was not in favor of surgery at the time, and the lack of contemporary records, leave little hard evidence of this possible achievement.

The narrative of the development of anesthesia by Hanaoka also gives those of us in the developed world interesting insight into how history and culture affect research ethics. In his initial research, he experimented with dogs, but prior to using *Tsusen san* for a surgery, he tested the compound on his wife and other members of his family. Reportedly, his wife lost her eyesight in middle age because of the repeated experimentation by her husband. In a fascinating echo of the past, as well as an indicator as to why Hanaoka's wife lost her vision, a Japanese anesthesiologist trialed a modern-day simulacrum of the *Tsusen san* compound on a trainee, demonstrating anesthesia, but also a mydriasis which persisted for seven days.[2,4]

Hanaoka developed a surgical practice whose fame spread across Japan, and he cultivated very numerous students. His hospital and academy in the city of Wakayama, called *Shunrinken*, expanded to almost three times its size as a result. Recent excavations of this building show evidence of a remarkably "modern," integrated system of practice, education, and sanitation. The new Wakayama Medical University openly acknowledges its lineage to *Shunrinken*, and an outdoor museum in the city simulates the 19th-century buildings while displaying Seishu's personal belongings.

There is still, clearly, much about medical practice to be learned from this remarkable surgeon, and as an internist (specifically a geriatrician), I am very taken with his motto *Naigai-goitsu Katsubutso-Kyuri*, which means "Physicians should master the principles of surgery, and surgeons should learn those of internal medicine."[2]

We can learn more than just effective medical techniques from earlier, Eastern physicians. Art gives us more than a single message and can transcend the local to tap into the universal. There is a beauty and a daring about the work of a great and pioneering surgeon that can easily get lost in the uniformity and routine processes of present-day surgical practice. In the illustration, the chrysanthemum-like efflorescence of the blood flows from the incision, and the surgeon's hands delicately manipulate the tumor. We, the viewers, become immersed in the immediacy, intimacy, skill, and danger of this operation. The calm, almost erotic beauty of the patient asserts her presence with serene force, and we witness her partnership with the surgeon in the actions of his caring and respectful hands. This partnership is light-years away from the objectified and depersonalized role in which the patient is cast in the great Western paintings of surgery in the 19th century.[5,6]

Those of us practicing medicine in the developed world would do well to remember that we can learn not just technical innovation from 19th-century Japanese physicians but also a stronger sense of the patient as a central focus and partner in the practice of medicine.

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See facing page for artwork.