

Foreword

Domo Arigato, Mister Roboto



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The word “robot” was introduced into the English language and into science fiction in 1920 by the Czech playwright Karel Capuk in his work, *Rossum’s Universal Robots*, which appeared about 3 years after his brother introduced the concept of an automaton^{1,2} (Figs. 1 and 2). The word *robot* comes from the Czech word *robota*, which means forced labor or activity. The robots in his play were humanoid in appearance with artificial intelligence and learning capabilities and, like the Terminators of the movie franchise, attempt to overthrow their human controllers and make their own destinies. Robots were popular characters in animated and live-action television shows in the 1950s and onward and are commonly used in many industries. The first robotic surgical procedure was a neurosurgical report of what we would now call stereotactic brain biopsy, by Kwoh and colleagues in 1988.³ Subsequently, use of robotics in prostatic, gynecologic, and abdominal and pelvic surgery blossomed and has become commonplace. Otolaryngologists first used robotic techniques in animal models in 2003 and subsequently in humans. Applications have increased exponentially.

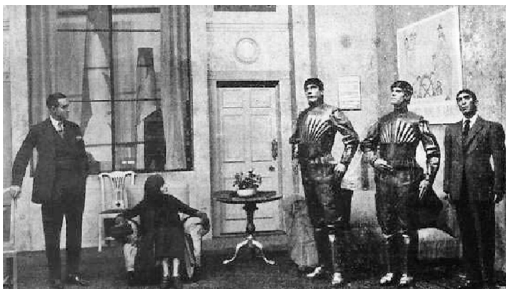


Fig. 1. Capuk’s play showing 3 robots.



Fig. 2. The original robot from the BBC radio production of Rossum's Universal Robots in 1938.

This issue of *Otolaryngologic Clinics of North America* on Robotics in Otolaryngology, guest edited by Drs Erica Thaler, Arun Sharma, and Umamaheswar Duvvuri, compiles the history, developments, utility, limitations, cost, and potential future of incorporating this technology into Otolaryngology practice. The breadth of information presented by the authors is remarkable.

Most of the otolaryngology applications of robotics involve head and neck surgery. The articles on TORS, or transoral robotic surgery, detail the history, the indications, and the open versus robotic discussions that must be undertaken by the surgeon when counseling patients. What began for adults has grown to encompass children as well. Reaching into a difficult-to-access place, such as the oropharynx, hypopharynx, and larynx, with a robot makes inherent intellectual sense. Salvage surgery in these areas can be made less traumatic with robots, in certain cases. The advantages of using robots for more easily accessible cases, such as thyroidectomy, salivary gland excision, and neck dissection, are harder to see. The authors of each of these articles make the case for both when to and when not to use robotic technology safely and effectively.

Ear surgery is already performed with technology: microscopes and endoscopes, lasers, drills. Adding robotics for atraumatic insertion of a cochlear implant electrode, for example, can be the next step in achieving hearing and structure preservation surgery and setting the stage for future hair cell and natural hearing restoration. Similarly, reaching into the anterior or lateral skull base as atraumatically as possible took a giant leap forward with the development of endoscopes; moving on to robotic procedures is a next logical step.

Finally, no discussion of technique or technology is complete without understanding potential complications, appropriate expectations regarding quality of life, and what the patient, physician, and health care system should know regarding costs. All of the aforementioned are covered well in this issue.

Drs Thaler, Sharma, and Duvvuri have compiled a comprehensive list of topics and authors with robust experience to provide the reader with an outstanding self-contained resource to understand robotics and how they may consider implementing their

use or expanding their use, in their own practice settings. As always, the more knowledgeable the physician and health care team are about technology, the better they can counsel patients for ideal shared decision making.

It is an exciting time to be an Otolaryngologist. Technological advances are helping us do more in smaller and harder-to-reach spaces than ever before. As Dennis DeYoung wrote and the band Styx recorded on their 1983 album “Kilroy Was Here,” *dōmo arigatō misutā robotto*. This translates from the Japanese to “thank you very much, Mr Roboto,” and we can say it is for allowing us to be better surgeons and offer our patients effective and minimally invasive surgery.

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