Procedure Removes Tumor, Rebuilds Trachea

Using a novel surgical approach, it's possible to rebuild the trachea and preserve a patient's voice after removing an invasive throat tumor, according to a new report from Henry Ford Hospital in Detroit. This case study is the first of its kind to not only document a successful technique to create a fully functional trachea, or windpipe, but also report a rare type of malignant tumor in an adult's trachea. Most commonly, this type of tumor is seen in newborns and very rarely occurs in the neck, says lead study author Samer Al-Khudari, M.D., with the Department of Otolaryngology-Head & Neck Surgery at Henry Ford Hospital.

"In this case, the patient's tumor had spread to the trachea, thyroid gland, muscles around the thyroid gland and nerves in the area," says Dr. Al-Khudari. According to head and neck cancer surgeon Tamer A. Ghanem, M.D., Ph.D., who led the Henry Ford surgical team. The easiest approach would have been to remove the trachea and the voice box, given the tumor's proximity to the larynx and other surrounding structures, but with this approach the patient would no longer be able to speak or swallow normally.

Instead, the surgical team took another route. Using tissue and bone from the patient's arm, they were able to reconstruct the trachea, restoring airflow through the trachea and saving the patient's voice. "We had to think outside the box to not only safely remove the tumor, but to allow for optimum functional outcome," says Dr. Ghanem, director of the Head and Neck Oncology & Microvascular Surgery Division at Henry Ford. "This is the first time such a large portion of a patient's trachea has been removed and rebuilt in a way that allows it to be fully functional."

This unique case will be presented January 29 at the poster session for the Triological Society's Combined Section Meeting in Scottsdale.The case study is centered on a 27 year-old man who had a large mass blocking 90 percent of his airway, making it very difficult for him to breathe. After a biopsy and other tests, Henry Ford doctors determined the mass was a malignant immature teratoma – a cancerous tumor that was quickly spreading throughout the areas of the patient's trachea and surrounding structures.

Such tumors are extremely rare; since the first reported case in 1854, there have only been 300 other reported cases.With the Henry Ford patient, surgeons first removed the tumor and about half of the patient's airway, just below the voice box.Using bone and skin from the patient's arm and two titanium plates, surgeon's reconstructed the airway, providing it with full coverage and allowing it to be fully functional.

Reconstruction of the trachea is challenging, due to the structural complexity and unique properties of the airway. The ideal reconstruction must not collapse during respiration and have some degree of mobility to allow for neck movement.

Currently the patient is using a tracheostomy tube – a tube that is inserted into an opening in the trachea to assist with breathing – but the surgeons do not expect it to be permanent. The patient, however, is able to speak and swallow normally. He also underwent chemotherapy as part of his treatment.

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