Helpful tool allows physicians to more accurately predict parathyroid cancer recurrence

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A newly-created prognostic tool reliably predicts the recurrence of parathyroid cancer, enabling physicians to identify patients at the highest risk. Consequently, the tool also helps to determine the optimum postoperative strategy, including aggressive surveillance and additional treatments, according to study results published online as an "article in press" on the *Journal of the American College of Surgeons* website ahead of print publication.

Parathyroid cancer is rare, and it is often difficult to diagnose. There is no definitive and effective medical management. The best chance of curing this devastating form of cancer is to make the diagnosis early and then surgically remove all tumor cells, avoiding spillage or spread of those tumor cells into surrounding tissue.

However, more than half of patients will develop a recurrence after the first surgical procedure, said study author Angelica Silva-Figueroa, MD, who recently completed a research fellowship at the University of Texas MD Anderson Cancer Center and is now an oncological surgeon, and head and neck surgeon at RedSalud Avansalud Clinic, Chile. "Currently there has been no reliable system to predict who will recur. What is needed is a prognostic staging system for parathyroid cancer. We do not know which group of patients has an increased risk of relapse at the time of diagnosis," Dr. Silva-Figueroa said.

For the study, researchers examined data on patients treated for parathyroid cancer between 1980 and 2016 at the University of Texas MD Anderson Cancer Center, Houston, Texas. From a sample size of 68 patient records, 26 patients developed recurrent disease after a median follow up of 4.6 years.

Rather than using the traditional parameter called disease-free survival, which evaluates the effectiveness of a therapy over time, the investigators assessed recurrence-free survival. After the initial operation to remove the tumor, the recurrence-free survival rates were 85 percent at one year, 67 percent at two years, and 51 percent at 10 years.

"The data points used to determine recurrence-free survival are quantitative and can predict disease recurrence in the first two to three years after disease resection," said study senior author Nancy D. Perrier, MD, FACS, chief of endocrine surgery, department of surgical oncology, the University of Texas MD Anderson Cancer Center. "This [approach] offers a means to stratify patients and consider more aggressive adjuvant treatment for those at higher risk of recurrence."

Patients with parathyroid cancer typically have significantly elevated levels of calcium in their blood as well as other abnormal parathyroid hormone levels. In the multivariate analysis, the research team identified three key prognostic indicators of parathyroid cancer recurrence: serum calcium level greater than 15 mg/dL, age over 65, and invasion of the tumor into blood vessels.

From there, the research team developed a simple predictive tool by combining these three variables. Patients were stratified into three risk groups—low, moderate, and high—based on the number of adverse characteristics each one had, which ranged from zero to three.

The study found that the two-year recurrence-free survival rate after

parathyroidectomy was 93 percent in those with zero adverse characteristics (low risk), 72 percent in those with one adverse characteristic (moderate risk), and 27 percent in those with two adverse characteristics (high risk).

The investigators also showed that, although the risk of recurrence is greater within two years after the initial surgical procedure, this risk continues to increase over the next 10 years and beyond in the moderate risk group, Dr. Silva-Figueroa said.

With this combination of measurable and available information, a patient's risks can be assessed. For individuals at elevated risk, additional surgery or other adjuvant therapies could be used early on to control cancer recurrence.

"We believe that this scoring system is the first step in personalized cancer care," Dr. Silva-Figueroa said. "The system may help physicians predict the clinical progression of this disease, reliably aid immediate postoperative treatment decisions, and guide clinical monitoring for progression."

This prognostic scoring system is currently being validated at four centers across the country. Once these prospective studies have been completed and results are published, the tool will be made available for public use.

"This article is an important contribution to the medical literature and should be employed for other rare tumors where data are insufficient to generate prognostic stages," said David Winchester, MD, FACS, Medical Director of Cancer Programs at the American College of Surgeons. "It's a good model to pave the way for future studies."

More information: Angelica M. Silva-Figueroa et al, Prognostic

Scoring System to Risk Stratify Parathyroid Carcinoma, *Journal of the American College of Surgeons* (2017). DOI: 10.1016/j.jamcollsurg.2017.01.060