The review of surgical management of neuroendocrine tumors (NETs) of the gastrointestinal tract, authored by Huang, Poultsides, and Norton, is both comprehensive and accessible for readers of all backgrounds. The authors describe the various tumor types, diagnostic methods, management decisions, and prognoses for a wide array of NETs of the gastrointestinal tract. They highlight the dichotomy between the management of the sporadic forms of these tumors and management of the familial forms. The senior author, Dr. Norton, has notable experience treating patients with NETs and has played a substantial role in outlining many of the surgical treatment strategies used today.

Many clinicians struggle to understand the variability and significance of NETs of the gastrointestinal tract. This is not an easy task, since even pathologists disagree on the classification of these tumors. My own understanding after medical school was incomplete, as I remember being unsure whether small NETs were cancer or not. After a decade of treating patients with these tumors, it is evident that they represent a spectrum of disease, but that even small tumors with indolent features can eventually show their malignant phenotype. To date, the World Health Organization (WHO), charged with classifying these tumors, still struggles with the precise definition. At a recent consensus meeting on NET staging, agreement was reached on assigning both a grade and a stage for all cases.[1] Grade can be assigned on the basis of mitotic rate or of Ki-67 immunohistochemistry (IHC)-positive percentage. Stage is assigned on the basis of organ of origin. A list of key elements necessary for staging was included in the consensus, such as presence of angiolymphatic invasion, IHC staining results, and tumor necrosis. Despite having reached some agreements, there were still substantial points of disagreement among experts, such as whether or not to change the designation of the lesions from "tumor" to "neoplasm," since "tumor" can represent a mass with no malignant potential. For now, the designation of "neuroendocrine tumor" remains the preferred term.

Ideally, as surgeons, we will meet patients early in the course of the disease, when cure or "durable remission" is possible, especially in patients with sporadic lesions. In reality, the metastases often cause the symptoms that bring the disease to medical attention—a point at which cure becomes unlikely. Fortunately, many patients live with NET metastases and are either minimally symptomatic or well-controlled on long-acting octreotide (Sandostatin LAR). When meeting with such patients in the office, it is important to explain the chronic nature of this disease to them and to their family. Patients with metastatic disease need to understand that these tumors will likely progress at some point, but that subsequent therapy to slow the progression may still be possible. I counsel all my patients to live their lives as normally as possible in between visits, but to make sure they follow up as necessary to determine if and when further surgical/ablative therapy may be warranted. The work-up for patients with NETs remains complex. Often the primary lesions are small and inconspicuous on endoscopy and imaging studies. Thus, the list of studies used to identify the primary lesions is long, especially for lesions of the gut. Patients may undergo serum and urine tumor marker analysis, CT and MRI, nuclear imaging (octreotide scanning and/or positron-emission tomography [PET]), upper and lower endoscopy, capsule endoscopy, double-balloon enteroscopy, and in some instances, angiography with venous sampling. Such a workup can be expensive and frustrating, but the patient must realize that localization is of paramount importance for optimal management and for providing the best possible outcome.

Another complex issue is that of how closely to follow patients with the various forms of NETs. What type of imaging is necessary and how often should it be ordered? There are guidelines provided by the National Comprehensive Cancer Network, but these recommendations are made based on low-level evidence.[2] In my practice, I have moved away from frequent nuclear imaging in favor of MRI with contrast, since liver lesions are better identified by this modality at my institution. Nuclear
imaging still plays an important role in determining therapy and planning surgery, but it is not what I use to follow patients on a routine basis. Once recurrence or progression of previously stable metastatic disease is encountered, the treating clinicians and the patient must work together to form a consensus plan of action. In the face of metastatic disease (liver, pancreas, gut), major organ resection plays an important role for some patients. However, the goal of these procedures must be clarified; that is, is it to relieve symptoms or to render the patient without evidence of disease? Occasionally, tumor debulking (such as partial hepatectomy with cholecystectomy) can be used to maximize transarterial regional embolic therapy with bland particles, chemotherapy, or radiotherapy.

Up to now, therapeutic management of well-differentiated NETs has largely rested on the shoulders of the surgeon, since medical options have been minimally effective. A new era of therapeutic options is burgeoning with the recently seen benefits of targeted agents such as everolimus (Afinitor) and sunitinib (Sutent) for patients with advanced pancreatic NETs.[3,4] As with colorectal cancer metastases, I suspect that as medical therapy improves, we, as surgeons, will be evaluating more patients whose disease was formerly unresectable because of its extensive multifocal nature, but who are rendered surgical candidates because of their response to drug therapy.

Finally, because we are treating clinicians, the education of our patients and their families remains an important aspect of our work. It can be helpful for patients to be given literature about their disease or to be referred to support groups that can provide both information and/or physical and emotional support. The review provided here by Huang et al is clear and comprehensive. Management of patients with these tumors often requires experience and remains an art.

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**References:**

**REFERENCES**


**Links:**

[1] [http://www.diagnosticimaging.com/authors/david-kooby-md](http://www.diagnosticimaging.com/authors/david-kooby-md)