Commentary

›› **Steven R. Goldstein, MD**

Does cancer cause menorrhagia? A lament on the decline of the art of medicine

🔁 Clinical pathways in which decision trees are dichotomous have become the mainstay of clinical practice. What's wrong with this picture?

"**D**oes cancer cause menorrhagia?" I asked on morning rounds recently. The response?

Blank stares. From students and residents.

"Well, what is menorrhagia?" I ask.

A resident regurgitates the textbook definition: "Abnormally heavy and prolonged menstrual bleeding lasting longer than 7 days or with blood loss exceeding 80 mL."

"OK. What is metrorrhagia?"

Another textbook definition: "Abnormal uterine bleeding at irregular intervals."

"Do you think cancer causes menorrhagia?"

Silence and sideways glances ensue. After a while, a junior resident says, barely audibly, "I guess so."

I pounce: "Do you really believe that cancer causes heavy bleeding every 28 days?"

The junior resident has fallen into my trap, which isn't so difficult to set or spring these days. It seems that contemporary medical training teaches residents how to regurgitate information on demand, but it doesn't do so well at showing them how to apply their knowledge to common scenarios.

Pay attention to the backstory

In my residents' world, all abnormal bleeding is reduced to "menometrorrhagia." In fact, this term is so common it has been affectionately shortened by these residents to "menomet." When I ask them what causes abnormal uterine bleeding, they recite the entire shopping list from UpToDate, with little or no understanding of how to determine which pathologies are likely, based on the patient's bleeding pattern.

We go through the entities that might increase bleeding at the "normal" time—a large cavity secondary to multiparity; uterine hypertrophy as a result of myomata (without a submucosal component); adenomyosis; a polyp in synchrony with the phases of the menstrual cycle.

Then we go over things likely to cause bleeding at an abnormal time—anovulation and all its causes; polyps; submucous myomas; hyperplasia; and carcinoma.

Last, we discuss situations where there might be overlap between the two, and the need to get as much reliable information from the patient as possible. After all, a patient can tell you a lot. Let me give you an example.

CASE

A 50-year-old patient taking unopposed estrogen reports that she had no menses for 4 months, followed by an episode of staining. Transvaginal ultrasonography reveals that she has an endometrial echo of 8 mm. The patient says that she had vasomotor symptoms that disappeared just before the staining. She is not obese but is mildly plump, without a personal or family history of diabetes. She is parous, with one normal spontaneous delivery.

We all know that unopposed estrogen in some women is a risk factor for hyperplasia and adenocarcinoma of the endometrium. Simple hyperplasia can be reversed with progestin administration, and the rate of endometrial cancer is reduced when a progestin is added to the regimen of a woman taking exogenous estrogen.

CASE CONTINUED

If I believed that this patient had experienced anovulation for 5 months, I would have chosen to administer progestin. But the history she reports

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Dr. Goldstein reports no financial relationships relevant to this article

(the vasomotor symptoms and amenorrhea) suggests 4 months of little or no ovarian function, followed by a resurrection of some ovarian function. As a result of the information she provides, and the several follicles visible during sonographic assessment, I am considerably less concerned about the unopposed estrogen than I might otherwise have been, and I am able to fine-tune my clinical management accordingly.
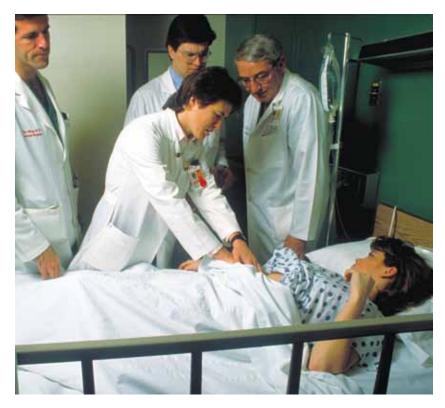
This type of assessment requires careful extraction of relevant information (i.e., a thorough history) and an understanding of the nuances of physiology and pathology. *These skills are, I believe, no longer being emphasized in medical education.*

That is a problem.

Algorithms can be deceptively simple

Clinical pathways in which decision trees are dichotomous have become the mainstay of clinical practice. Using one such tree, we conclude that an endometrial echo of 4 mm or less in a woman who experiences postmenopausal bleeding carries a cancer risk that is so low, no biopsy is necessary. (Notice now that this is *postmenopausal* bleeding, not menorrhagia or metrorrhagia!) This conclusion is based on excellent prospective data, but the cutoff of 4 mm is somewhat arbitrary. A higher cutoff allows more cancers to escape detection, and a lower number results in more interventions, such as dilatation and curettage, hysteroscopy, or saline-infusion sonohysterography (and, I hope, not blind suction piston biopsy, unless you are sure the process is indeed global and not focal).

We have ultrasonography machines that produce measurements

down to hundredths of a centimeter! Some nights I wake in a cold sweat, worried that a clinician will get an ultrasound report of a 3.94-mm endometrial echo and conclude that the patient is fine, or that a report of 4.03 mm will prompt a clinician to go all the way to hysterectomy, if all else fails, just to get a bit of tissue! Where is the thought process—the art of medicine?

When I give third-year medical students their first didactic lecture of the clerkship, I implore them to ask, "Where does that come from?" "Who is the exception?" "Why?" Our patients expect us to be able to think, to understand why we do what we do, to realize who the outlier is or may be. Otherwise, why get a medical degree?

Patients often consult a physician out of fear of being the numerator. Maybe only 1 in every 305 women 35 years old will deliver a chromosomally abnormal baby. Or maybe only

3 to 7 of every 100 postmenopausal women who experience uterine bleeding will have endometrial cancer. The odds may be in the patient's favor, but she is afraid that she might turn out to be that 1, or those 3 to 7, in the numerator of the equation.

Enter the EHR

With so much of clinical practice designed to be carried out by algorithm, our students are learning what to do but not why—so who will design newer and better algorithms in the future? The likely source of those new algorithms: the electronic health or medical record.

Computer experts, who need to know little or no pathophysiology, will be able to mine outcomes databases. For instance, they might analyze an institution's last 3,000 cases of proven ovarian torsion, including dozens of parameters such as white blood cell count, size of the mass on

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ultrasonography, body temperature, and number of hours the patient experienced pain. Then they will perform a regression analysis on this data and develop a receiver-operating-characteristic (ROC) curve with the best "fit" for a manageable number of parameters. The physician will plug the data into a handheld device and, depending on which side of the curve the patient falls, will take her to the operating room or manage her expectantly.

There will be little need, or even tolerance, for judgment or experience.

When I describe this scenario to a colleague—he's the safety officer on labor and delivery—he says we need protocols to protect patients because so many clinicians who rely on judgment and experience are doing a mediocre job. I argue that medicine by protocol narrows the bandwidth. It may bring the bottom up, but it also brings the top down. More people will get better care, but the outlier probably won't.

But why do people go to the doctor? For fear of being the outlier!

Can we fix this problem?

Probably not.

The entire medical field is moving toward enhanced care for the majority at the expense of the few.

Patient-safety systems and algorithms are the wave of the future.

A drop in the bucket

I still give that pep talk to third-year medical students as they enter our rotation, in the hope that it will resonate with even one or two of them, who may resolve to develop and cultivate judgment and experience even within the system that is enveloping us.

As for the rest of the students, they'll squirm uncomfortably in their seats, or get confused on morning rounds—and, maybe, assert that cancer indeed causes menorrhagia.