Chemotherapy-Induced Peripheral Neuropathy

Peripheral neuropathy is a common complication of multiple widely used chemotherapy agents, and this symptom often limits our ability to have patients continue on the same treatment, even when it’s effectively treating the cancer. Typically, the symptoms are more sensory than motor, and the leading complaints are numbness and tingling, cold sensitivity, sometimes burning, electric, and sometimes normal pressure is perceived as painful. Diminished proprioception, the perception of a person’s body in space, can lead to balance problems and falls. And while dysfunction of autonomic nerves, which mediate the body’s automated body processes like temperature regulation, blood pressure and heart rate bowel function, etc., is felt to be rare, this hasn’t been well studied. It’s possible that issues like difficulty regulating blood pressure, constipation, and urinary difficulties may in fact be related to neuropathy of autonomic nerve function.

The classical side effect of chemo-induced peripheral neuropathy is sensory and symmetric, affecting both sides of the body relatively similarly, unlike nerve compression, which affects a single nerve and is not symmetric. Because neuropathy preferentially affects the longest nerves of the body first, and these are the nerves that run from the spinal cord to the tips of the feet and hands, a neuropathy in a stocking-glove distribution is what is typically seen.

The typical pattern of onset is that it gradually increases in severity over ongoing treatment with the offending agent(s) and is dose-dependent. One interesting pattern is coasting, which is the observation that the neuropathy can sometimes worsen for several weeks to months.
after the chemotherapy has been discontinued.

Among our anti-cancer treatments, the most common offenders are the platinums (cisplatin far more than carboplatin, and oxaliplatin can also do this but especially causes a severe cold sensitivity), the taxanes, navelbine (vinorelbine) and other "vinca alkaloid" drugs in the same class, thalidomide, and a few others.

Most commonly, symptoms improve with time off of these treatments, but the improvement may be over a course of days or may persist for several months, and sometimes people can have permanent deficits. Accordingly, there have been efforts to both prevent/protect against the onset of neuropathy and also to treat established neuropathy, and we'll turn to the work on potential treatments next.