The last decade has seen enormous progress in the treatment of spinal oncology. Advanced surgical techniques, new chemotherapeutic agents, and targeted radiotherapy have allowed functionally compromised patients the ability to enjoy an extended life span. This prolonged survival, often measured in weeks or months, has also produced improved functional outcomes and decreased pain.

Nevertheless, despite the best efforts of spine surgeons and oncologists, there is a cohort of patients for whom these treatments do not work, either because the tumor has recurred or because the patient is not a candidate for the usual regimen of surgery and/or radiation therapy. These patients are often out of therapeutic options.

It is for these desperate patients that unique, outside-the-box treatments are designed. One such treatment is that advanced by Patsalides et al. They conducted a Phase I trial that looked at the safety and efficacy of using spinal intraarterial chemotherapy (SIAC) in patients in whom more conventional treatments have failed. Nine patients with 7 different primary tumors and spinal cord compression underwent selective spinal angiography and delivery of the alkylating agent melphalan, which has been shown to be useful in treating other tumors via the intraarterial (IA) route.

There were no real safety issues with this agent, although 1 of the 9 patients developed neutropenia. Two other patients had progression of their metastatic disease at distant locations; only 1 patient had improvement of local tumor burden. The rest of the patients had local control of their tumors, as evidenced by 4-week MRI.

Some cautionary notes must be sounded. Although SIAC seems to be a relatively safe treatment, this was a small cohort of patients and follow-up was quite short. Only 1 patient had follow-up as long as 7 months; two-thirds of the patients were followed for 3 months or less. Initially, 3 rounds of IA injections were planned for each of the 9 patients, yet only 4 patients received the full treatment course, usually due to systemic or local disease progression.

Several other questions regarding this therapy await answers. Who is the appropriate candidate for such treatment? Can locally delivered IA chemotherapy be used as a preoperative or perioperative adjunct? Is melphalan the ideal drug for tumors of such diverse pathological types? Perhaps most importantly, what is the cost of this treatment, who should pay for it, and is it worth the small extension of survival it may provide?

The real answer for the physicians who take care of these patients is that we must continue looking for novel solutions to these dismal clinical scenarios. It is possible that these and other catheter-based therapies, which have enjoyed a parallel revolution with our sophisticated surgical techniques, will continue to offer some hope for severely compromised patients. After that, neuroradiological treatments will be extended to other spinal oncological problems, and perhaps they will be an alternative to current surgical or radiotherapy modalities. Hopefully other investigators will see this report as a first step in that direction.

Reference

Disclosure
Dr. Arnold is a consultant for Medtronic Sofamor Danek, FzioMed, Spine Guard, and Stryker Spine. He owns stock in Z-Plasty, and has had his travel sponsored or reimbursed by AOSpine North America and Stryker Spine. Dr. Harrop is a consultant for DePuy Spine, and he receives support of non–study-related clinical or research efforts from Asterias, Bioventus, and Tejin.
Response

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We thank the authors for raising important points regarding our series of patients treated with SIAC. The purpose of this novel approach is to achieve local control of progressive metastatic epidural disease for which the standard therapies have failed.

Briefly, we reported our results in 9 patients with progressive metastatic epidural disease who weren’t candidates for further surgical or radiation treatments. There were 19 SIAC infusions of melphalan at the level(s) of the progressive epidural metastatic disease, and the patients were followed with MRI scans at 4 weeks after the last SIAC infusion and thereafter as clinically indicated. The follow-up duration was short (range 1–7 months, median 3 months), reflective of the advanced disease of most patients enrolled in the trial. Eight of the 9 patients demonstrated short-term local control of the previously progressive epidural disease, whereas in 1 patient the tumor progressed. Of the 8 patients with local tumor control at the site of SIAC, 7 had progressive metastatic disease at other spinal levels where SIAC was not applied, as was evident on the follow-up MRI scans. One of the 9 patients developed febrile neutropenia as a result of the treatment, but there were no other serious adverse events.

In our opinion, the pertinent message of this study is that SIAC may prove beneficial in patients with progressive epidural disease despite prior surgery and radiation, therefore preventing inevitable neurological demise from spinal cord/cauda equina compression and improving the patient’s quality of life. We do agree that there are important limitations of this study: small number of patients, slow accrual, a single drug for multiple histological types, and short-term follow-up. Clearly, a lot more work needs to be done. We are committed to completing the Phase I trial, and we hope that we will provide enough data to support a multicenter trial with a larger number of patients and longer follow-up.