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Commentary: Classifying descending necrotizing mediastinitis: What's the upshot?

Robert B. Cameron, MD

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CENTRAL MESSAGE

Classifying descending necrotizing mediastinitis into Types I and II informs prognosis, but further subtyping Type II infections may only define disease stage and possibly quality measures.

Descending necrotizing mediastinitis (DNM) is a relatively uncommon but potentially fatal disease. Infections often beginning in the head/neck area quickly and aggressively spread along known anatomic planes into defined mediastinal compartments. Based on a mere 4-patient experience, Endo and colleagues[1] divided DNM into 2 main categories: Type I (anterosuperior mediastinum cephalad to the carina) and Type II (lower mediastinum). They further subdivided the lower mediastinal infections into Type IIA (anterior lower) and Type IIB (anterior and posterior lower). With such limited numbers, the only appropriate conclusion was that DNM classification might standardize required drainage procedures, although admittedly computed tomography scans exclusively determined drainage targets.

Sugio and colleagues[2] collated an impressive number of DNM cases (n = 225) over a 5-year period from 131 participating institutions with both cervical and thoracic expertise as part of a jointly sponsored Japanese study (JBES1703/JACS1806). Extensive cataloging of microbiology results and both initial and reoperative surgical approaches are presented in detail. Analysis of the copious data at times becomes overly complex, such as correlating the anterior pre-/paratracheal and the posterior prevertebral anatomic planes of cervical-mediastinal infection spread. Further, the mortality analysis notes a 30-day mortality of 3.6% (8 patients) and a 90-day mortality of 5.3% (12 patients), which are both outstanding. But surprisingly, later only 7 (of all 28) deaths during the entire 3- to 5-year follow-up period are attributed directly to DNM. Using a logistic regression model, the authors clearly show that Type II (vs Type I) infections were associated with a greater 90-day mortality (odds ratio, 4.63; $P = .034$); age also adversely influenced survival. With this large dataset, an additional DNM class type not previously specifically reported was recognized in 43 patients (34.4%) with superior and only posterior lower mediastinal involvement termed Type IIC. This simple extension of the prior classification system (not a truly new system as the article title implies) curiously revealed that these Type IIC infections were more amenable to transcervical drainage, thus requiring fewer thoracotomies than other Type II infections. Additional interesting information regarding the Type II subtypes then stops. For instance, Sugio and colleagues'[2] Table E6 shows no 90-day mortality differences between any Type II infections. Frustratingly, the 30- and 90-day mortality numbers are grouped simply into Type I and II (1 out of 2 and 7 out of 10, respectively) without detailed subtype distribution differences. This raises a fundamental question: Is there any utility to the subdivision of Type II patients? Perhaps only Type I and II DNM types should exist, merging/grouping subtypes with similar outcomes—following a rationale similar to that used for TNM stage groupings in lung cancer. Perhaps, the only clear potential use for Type II subgroups is to provide a DNM stage-based guideline and quality measure for identifying and measuring appropriate computed tomography-confirmed

From the Division of Thoracic Surgery, Department of Surgery, David Geffen School of Medicine at UCLA and Division of Thoracic Surgery, Department of Surgery and Perioperative Care, West Los Angeles VA Medical Center, Los Angeles, Calif.

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Address for reprints: Robert B. Cameron, MD, Division of Thoracic Surgery, Department of Surgery, David Geffen School of Medicine Center for the Health Sciences, Room 64-132, Box 957313, 10833 Le Conte Ave, Los Angeles, CA 90095-7313 (E-mail: rcameron@stanfordalumni.org).

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TABLE 1. Sample surgical quality measures based on descending necrotizing mediastinitis class/stage

	Procedures				
Class/stage	**Gold standard**	**Acceptable alternate**	**Acceptable alternate**	**Acceptable alternate**	**Borderline/ suboptimal**
Class/stage I	Cervicotomy (Bilateral)	Cervicotomy (Unilateral)	None	None	Percutaneous image-guided drainage
Class/stage II					
IIA	Cervicotomy (bilateral) with Subxiphoid debridement/ drainage	Cervicotomy (unilateral) with Subxiphoid debridement/ drainage	Cervicotomy (uni- or bilateral) with Bilateral thoracoscopic drainage	Cervicotomy (uni- or bilateral) with Bilateral thoracotomy with drainage	Cervicotomy alone
IIB Alternate: IIA/P	Cervicotomy (uni- or bilateral) with bilateral thoracotomy and drainage	Cervicotomy (uni- or bilateral) with bilateral thoracoscopic drainage	Cervicotomy (uni- or bilateral) with unilateral thoracotomy and drainage	Cervicotomy (uni- or bilateral) with unilateral thoracoscopic drainage	Cervicotomy (uni- or bilateral) with simple uni- or bilateral tube thoracostomy
IIC Alternate: IIP	Cervicotomy (uni- or bilateral) with bilateral thoracotomy and drainage	Cervicotomy (uni- or bilateral) with bilateral thoracoscopic drainage	Cervicotomy (uni- or bilateral) with unilateral thoracotomy and drainage	Cervicotomy (uni- or bilateral) with unilateral thoracoscopic drainage	Cervicotomy (uni- or bilateral) with simple uni- or bilateral tube thoracostomy and other lower mediastinal drain(s)

surgical drainage targets and procedures (Table 1). In this instance, I favor designating Type I and Types IIA (anterior), IIP (posterior), and IIAP (anterior and posterior) as intuitive. With their extensive dataset, perhaps the authors will extend their analysis to the next level and address some of these additional areas.

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