Interscalene Brachial Plexus Blocks and Phrenic Nerve Palsy

To the Editor:

We were interested to read Kaufman et al.'s1 article on the surgical treatment of 14 cases of permanent diaphragm paralysis after shoulder surgery, but dismayed to read the editorial that accompanied it,2 in which it was stated that the diaphragmatic paralysis was “clearly due to phrenic nerve damage after interscalene brachial plexus block.” This assertion is open to question and is not supported by the data presented by Kaufman et al.1

There is a remarkable similarity between this assertion and that made for many years that the ulnar neuropathy suffered by some patients after surgery was clearly due to errors in on-table positioning that resulted in external nerve compression. The finding that there was a preponderance of obese male patients suffering ulnar nerve neuropathy led to a view that the diaphragmatic paralysis was “clearly due to phrenic nerve damage after interscalene brachial plexus block.” This assertion is open to question and is not supported by the data presented by Kaufman et al.1

Competing Interests

The authors declare no competing interests.

References


Anesthesiology 2014; 120:1050-9

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(Accepted for publication November 25, 2013.)

Postsurgical Inflammatory Neuropathy Should Be Considered in the Differential Diagnosis of Diaphragm Paralysis after Surgery

To the Editor:
We read with interest the article by Kaufman et al.1 on the development of phrenic neuropathies after intraoperative scalene block. Although these cases are well described and instructive in the role of adhesions contributing to phrenic neuropathy, this is but one potential mechanism by which inflammation may contribute to the development of perioperative neuropathies. Local or generalized inflammation of the microvessels in nerve and subsequent ischemic injury are observed in a variety of neuropathic conditions, including diabetic and nondiabetic asymmetrical neuropathies2,3 and idiopathic and hereditary brachial plexus neuropathy,4 the latter of which is also reported to have a predilection for the phrenic nerve. These conditions may first become symptomatic peripherally and can have significant medicolegal implications.

We have previously reported on patients who developed a variety of neuropathies, including phrenic neuropathy, after surgeries.5 In 21 of the 33 patients, a biopsy of the superficial sensory nerves distant from the site of surgery was done, and we observed abnormal amounts of nerve inflammation in all of these and signs of nerve microvasculitis in 71% of these. Our study found that immunotherapy with steroids often can improve the pain and weakness associated with these neuropathies. In summary, although Kaufman et al. have reported localized adhesions as one important cause of postsurgical phrenic neuropathy, clinicians should consider diverse potential etiologies of postsurgical neuropathies, including nerve microvasculitis.

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Competing Interests
The authors declare no competing interests.

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References

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In Reply:
Bellew et al. take issue with my statement1 that the patients reported by Kaufman et al.2 developed “chronic diaphragmatic paralysis that was clearly due to phrenic nerve damage after ISB [interscalene blockade].” However, there was obvious phrenic nerve damage sufficient to cause diaphragmatic paralysis, which usually recovered with treatment of that nerve, and a block had been performed. My statement is a correct summary of the report boiled down to its scientific bare bones. This statement was immediately followed by my comment regarding the Kaufman data that “Few conclusions can be made from a case series with certainty, but their observations support several preliminary hypotheses.” Because I offered only hypotheses on this matter, I suspect that it is actually with these hypotheses that Bellew et al. are uncomfortable. Yet it is established that local anesthetic reaches the phrenic nerve and anterior scalene muscle, that local anesthetic damages nerves and especially muscle, and that muscle damage leads to scaring. Given what is known, it would be surprising if phrenic nerves were not damaged by interscalene local anesthetic injection.