In reply:—We have read with interest the letter by Teeple and Ohia regarding our case report. Our purpose was to present an unusual case of severe causalgia following vascular abdominal trauma and to try to explain its mechanism. It was not our intention to review and enumerate all the therapeutic alternatives. This response is to clarify some inaccuracies and misconceptions that we think are important.

1) We were dealing with a major type of causalgia. The injection of a placebo in a patient with severe symptomatology as this patient had, would be unreasonable.

2) Dr. Teeple et al. misread our paper. Surgery was performed five weeks after the abdominal injury, not one week, as stated.

3) The statement that Bonica suggests a minimum trial of six sympathetic blocks is not supported by the references given. However, careful review of the literature suggests a recommended range from 3 to 6 such blocks. It is our experience that following the initial diagnostic-prognostic block, it is important to note and record accurately the relationship between the pharmacologic duration of the block and the duration of analgesia. If the relief of pain outlasts the duration of the block, one should continue such treatment. If the relief lasts longer than the block, it should be repeated at least once and preferably twice, so as to confirm the initial result and thus minimize errors in diagnosis and/or prognosis. Once the diagnostic-prognostic step is done, it is thus possible to avoid fruitless persistence with sympathetic blockade and institute definitive therapy without delay.

4) We disagree with the statement that "... the causalgia may be a temporary condition that may resolve spontaneously." Spontaneous remission of causalgic pain is rare. Shumacker reported remission in three of 90 patients. While a few patients experience spontaneous remission without proper treatment, the majority, far from improving, become progressively worse. We strongly believe if therapeutic results are going to improve this condition, early and aggressive treatment are essential.

5) The great majority of cases of lumbar sympathectomy are carried out through a lateral or flank incision, with a retroperitoneal approach. The anterior or transperitoneal route is used only on rare occasions when some additional indication for laparotomy exists. We are not aware of a posterior approach.

6) Either general or regional (spinal or epidural) anesthesia may be used for a lumbar sympathectomy. We are not aware that the choice of one anesthetic technique is of significance for the procedure.

7) While there is general agreement about the efficacy of sympathetic blocks for diagnosis and prognosis, there is disagreement regarding their value as a therapeutic procedure. Our experience, as well as that of other writers, has shown that total sympathectomy is an effective method for the relief of pain in causalgia. Most of the authors reported good results in over 90% of the patients subjected to sympathectomy. Failure is probably due to incomplete denervation. The operation is simple, safe, and has excellent results in the hands of an experienced surgeon. Therefore, there is every reason to operate at an early date before the patient has become dependent on narcotics, developed neurotic tendencies, or irreversible trophic changes.

In conclusion, we think that in severe causalgia, if a series of sympathetic blocks produces complete but only temporary relief, sympathectomy should be carried out. Whether this should be achieved chemically or surgically depends on the particular case. In young, healthy patients, we strongly believe that surgical sympathectomy is preferable.

Marcos Szeinfeld, M.D.
Assistant Professor of Anesthesiology

Vicente S. Pallares, M.D.
Professor of Anesthesiology
Department of Anesthesiology and Pain Clinic
University of Miami School of Medicine
P. O. Box 016370, R-370
Miami, Florida 33101

References


Vive Pascal!

Effective January 1982, the Editorial Board of Anesthesiology laid the torr unit (equivalent to a pressure of 1 mmHg on earth) to rest. Instead, pressure measurements now are to be reported in mmHg (or cmH₂O) or, alternately, in kilopascals (kPa). As Michenfelder points out, editors of United States medical journals have been reluctant to foist unfamiliar SI units such as kPa or molar concentrations on their readers. British and Canadian colleagues, on the other hand, bit the bullet so as not to fall behind international practice. To make the eventually inevitable transition to SI units of pressure less painful, there follows a brief account to help readers interpret forthcoming reports in this and other journals.

The International System of Units (SI, for Systeme International) started in 1875 when 17 nations founded the International Bureau of Weights and Measures and established prototypes for units of length (meter) and mass (gram), based on reference models stored in Paris. Two World Wars later, six natural indestructible Base Units (meter, kilogram, second, etc.) were redefined in 1960 by participating nations, including the United States.* A seventh base unit (the mole) was added in 1971. Derived Units (e.g., meter per second) are obtained by product and quotient operations on base units, with special names given to frequently used units such as pascal instead of the awkward m⁻¹·kg·s⁻². Decimal multiplier (e.g., kilo) or quotient (e.g., milli) operators, called prefixes, finally reduce base and derived units to conveniently sized SI Units.

SI Units of Force

Though force itself has little application in clinical practice, it provides the basis for pressure. Force is a physical action that, when unopposed, alters the position of an object. A familiar force is the gravitational pull of "weight." The outdated dyne will be replaced by the newton (N), named after the great 17th-century English scientist. The newton is defined as that force which accelerates a mass of one kilogram by one meter per second per second (m·kg·s⁻²). For example, the gravitational pull on a 1-kg mass (its "weight") is nearly 10 N (9.807 N, to be exact). One dyne (dyn) equals 10⁻⁵ N or 10 μN.

SI Unit of Pressure

Pressure is defined as perpendicular force exerted per unit area. Atmospheric pressure, for instance, is the "weight" of the atmosphere pressing on the earth's surface (about 100 N/m²). The SI unit of pressure is named pascal (Pa), after the French scientist-philosopher who developed laws of pressures in gases and liquids. One pascal is a force of one newton per square meter (N/m²), or m⁻¹·kg·s⁻² in base units. Since the pascal is a small pressure, the kilopascal (kPa) is the preferred unit for general medical use. Standard atmospheric pressure (760 mmHg) is equivalent to about 100 kPa (101.3 kPa). Conveniently, equating barometric pressure with 100 kPa, each 1% of a gas mixture exerts a partial pressure of 1 kPa. The partial pressure of oxygen in air, for instance, is 21 kPa. Immediate conversion from mmHg (torr) or cmH₂O to kPa may be obtained from commercial tables.

American engineers and scientists have accepted the newton and pascal out of necessity, and industry is not far behind. Nonetheless, the transition from mmHg to kilopascal will be unpopular with physicians because it demands learning new numbers. Yet, when the dust settles in a few years, substitution of one universal unit for the bewildering array of cmH₂O, torr, millibar, atmosphere, etc. will probably be viewed as progress and considered worthwhile.


RUDOLPH H. DE JONG, M.D.
Professor
Department of Anesthesia
College of Medicine, University of Cincinnati
231 Bethesda Avenue, ML #331
Cincinnati, Ohio 45267