Neurosurgical Techniques

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Surgical Repair of Myelomeningocele

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It is obvious that a standard operative procedure cannot be described which will be applicable to all patients with myelomeningocele. There is an almost infinite variety of these lesions, extending from a small parchment-like midline membrane covered by poorly developed squamous epithelium and accompanied by no neurological deficit, to extensive myeloschisis of many segments accompanied by total loss of neural function below this level. To illustrate our surgical method we have chosen an example that is somewhere in between, namely, a medium-sized lumbar myelomeningocele covered partially by skin of varying thickness and partially by a thin, poorly epithelialized membrane. In the lesion selected, it will be noted that most of the elements of the cauda equina are adherent to the inner surface of the myelomeningocele. This is extremely common, both in lesions accompanied by total loss of distal neural function and in those accompanied by moderate or negligible loss of function.

Certain general comments will first be made, with the suggestion that the reader interpret these as pertaining to the average lumbar myelomeningocele illustrated and adopt specific modifications for the individual patient.

Each patient with a myelomeningocele should be assessed carefully. Various considerations determine the type of operative procedure and the optimal time to carry it out. These include such variables as the spinal level of the lesion, size and shape of the lesion, the condition of the surrounding skin, the age of the patient, the neurological status, the adequacy of cerebrospinal fluid circulation, the presence of other congenital anomalies, the past family history, and the socio-economic status of the family.

Myelomeningoceles that occur in the cervical region as well as the rarer lesions along the thoracic spine are usually smaller, are apt to have a narrow dural neck, and seldom contain significant neural tissue. Technically, they are much less of a problem than the type of lesion in the lumbar and sacral areas to be described.

The optimal time for surgical repair of a myelomeningocele is during the first 24 hours of life. Every effort should be made to see these babies as soon as possible after delivery, and to carry out surgical repair if it is deemed technically feasible before there has been contamination of any unepithelialized surface. Newborn babies with myelomeningoceles should be given nothing by mouth except sterile water. Under these circumstances, there is little or no bacterial activity in the intestinal tract and the meconium remains essentially sterile.

It must be accepted that all incompletely epithelialized myelomeningoceles seen after 48 to 72 hours of life are superficially contaminated; sterilization of the surface of the lesion prior to operation then becomes a difficult problem. If surgical repair is not carried out in the first 24 hours of life, a time must be selected when, in the surgeon's best judgment, the surface of the lesion has been made as clean as possible, and the baby's general condition warrants going ahead. If surgery is not done during the first day or two of life, it may be wise to delay for a number of weeks, or even months, until the local and general situations become optimal. On the other hand, however, long delay in the presence of an ulcerated or leaking lesion may often increase the danger of meningitis.

A principal complicating factor of every myelomeningocele is inadequacy of the cerebrospinal fluid circulation. When myelomeningocele excision has been performed in the newborn period, a shunting procedure to treat hydrocephalus is done, if necessary, 3 or 4 weeks later. If the patient is first seen after the newborn period and progressive hydrocephalus is evident, it may be wise to per-