33. The Orthopedic Treatment of Patients with Apallic Syndrome

K. ZHUBER, M. SALZER, and F. GERSTENBRAND

Most patients with an apallic syndrome show a characteristic disorder of motor functions which is manifested in an increase of muscle tone and a disorder of body posture, corresponding to the midbrain posture. The upper extremities are thus adducted in the shoulder and flexed in the elbow, while the hand is in a fist position. The lower extremities show a slight flexion of the hip and knee joint, as well as plantar flexion of the feet. But sometimes variations are found that are caused by a lateralization of the midbrain lesion. This again causes an asymmetric posture of the joints, whereby the hip joints are not only flexed but also adducted in one joint and abducted in the other.

These changes of posture are maintained by a centrally regulated increase of muscle tonus. Without treatment a prolongation of these postural anomalies will cause contracture of muscles and a "freezing" of the joints in this position. In the first phase, passive joint movements are still possible; but after shrinking and shortening of the muscles and ligaments, myogenic and subsequent arthrogenic contracture will result. The severity of such an increase of the muscle tone could be observed in one of our patients, who developed a bilateral luxation of the hip as a consequence of the adduction spasm.

A further complication of the apallic syndrome is the development of new bone tissue around the large joints, termed as periarticular ossification. Only a few reports are available concerning periarticular ossifications in connection with the apallic syndrome (Jeannopoulous et al., 1961; Gerstenbrand et al., 1970a), while numerous authors have reported on this problem in association with traumatic spinal cord lesions (Abrahamson, 1948; Armstrong-Ressy et al., 1959; Damansky, 1961; Déjerine and Ceillier, 1918; Liberson, 1953; McNeur, 1954; Miller and O'Neill, 1949; Hardy and Dickson, 1963). But periarticular ossifications were also observed in several other neurologic diseases, such as myelitis (Damansky, 1961), central hemiplegia (Irving and Le Brun, 1954), brain tumor, and meningitis (Lorber, 1953), as well as poliomyelitis (Costello and Brown, 1951; Freiberg, 1952). In the latter, ossifications were also described in the metacarpophalangeal joints. Ossifications of this kind are rarely seen following extensive burns (Johnson, 1957; Evans and Smith, 1959).

Orthopedic Therapy

Therapeutic measures in treatment of the apallic syndrome are initially concentrated on the immediate preservation of life. Even at the earliest stage the orthopedist has to be consulted. The prevention of decubitus ulceration and joint contracture is of greatest importance during the intensive therapy period, and depends on a disciplined routine of nursing management,
which includes turning the patient at regular intervals of 4 h. During the initial stage, i.e.,
the phase of the acute midbrain syndrome, the patient reacts to the slightest external sti­
muli with stretch cramps and an emergency reaction which stresses his circulatory and
metabolic system. Early attempts at passive joint movements are rejected by the patient’s
vegetative lability. Passive joint movement should be started and later intensified, only
after subsidence of the acute disinhibition of the muscle tone. Before that, special phys­
tical therapy has to be commenced by using the tonus-regulating reflexes. In the subsequent
course of the remission stage, physical treatment gains in importance.

If, in spite of these measures, joint contractures develop, different orthopedic measures
must be undertaken. In addition, it is of the greatest significance to consider the patient’s
general condition as well as his trophic situation. Premature active orthopedic treatment
using casts or bandages, may lead to formation of decubital ulcers on the extremities. They
will cause unfavorable healing tendencies and retard the course of remission.

Treatment with Casts

The utilization of removable casts enables one to keep an extremity in a certain passive
position. Early in the course of the apallic syndrome this aid may be used as a prophylaxis
in joints prone to contracture in order to prevent a malposition. In addition, already exist­
ing contractures may still be treated in this manner. A succession of casts are used. The
procedure is as follows: A joint inclined to contract is passively extended after which a
temporary cast is applied. After an interval of several days this procedure is repeated until
correction is achieved. Finally, during mobilization of a patient, these casts may be used
for keeping joints within the allowable maximum flexion and extension. Applications of
this kind require little effort and since they can be removed, the casts will not interfere
with the patient’s nursing care. Even physical therapy may be continued without interrup­
tioin. Pressure points must be watched carefully since decubital ulcers may develop. Cast
treatment will be unnecessary after the patient has regained active muscle function.

Wedging

Existing myogenic contractures or already developed arthrogenic contractures on a single
joint, may be treated with a wedged cast. Initially a circular cast is applied around the joint
to be treated. Transsection of the cast and the maximum possible extension of the joint
follow. Then the cast is fixed in this position. Within a few days the contracted tissue will
adapt to the temporary extension, after which the above procedure may be repeated.

Redressment

In some rare cases of an apallic syndrome, redressment may offer a further possibility of
mobilizing a joint fixed in a malposition through a forced joint movement under narcosis.