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Abteilung für Technische Orthopädie und Rehbailitation der
Orthopädischen Universitätsklinik Münster.

INDIVIDUAL MOLDED SEAT-SHELLS FOR SEVERELY HANDICAPPED PERSONS

G. G. KUHN

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The physically handicapped person, spending the greater part of the day in a chair is dependent, even more than a healthy person, on a well-fitting seating possibility. Often it is not possible for him to shift his weight to distribute pressure and increase blood circulation.

Figure 1. Working chair with individual molded seat-shell.

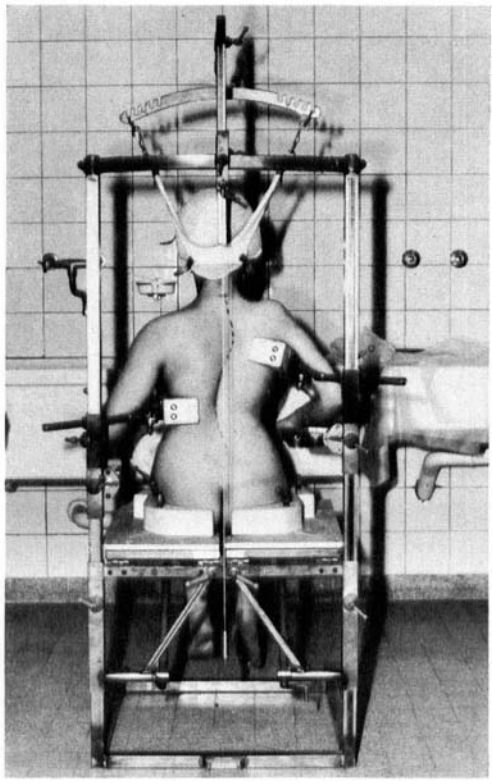

Figure 2. The patient is prepared for casting. The correction is obtained by pneumatic pads and extension.

For these reasons it is essential that the severely handicapped person be supplied with a seat which conforms with his anatomical requirements. It cannot be obtained in the available, mass-produced wheelchairs and their accessories. We therefore decided to develop a possibility to build individually molded seat-shells.

First a chair was constructed, adjustable in all parts and planes, in which the patient is seated (Figure 1). The chair is then adjusted to obtain the most favorable position and correction. Plaster-of-Paris strips are placed on the seat and back after the patient has been removed and he is then replaced in the former position (Figure 2). In this way the mold is taken. After the plaster has set, the patient is again removed and the mold can be reinforced.

The cast, which at this point can already be called a molded seat-shell, is installed on a base-plate which can be adjusted electrically in all planes. With the aid of this it is possible for the patient himself, as well as for the orthotist, to obtain the optimal alignment of the

Figure 3. Patient on the powered alignment unit.

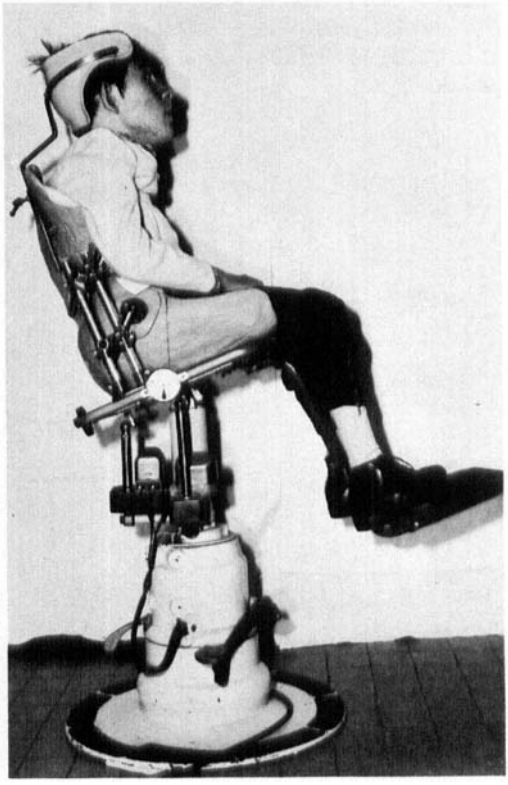

Figure 4. Lamination of the shell.

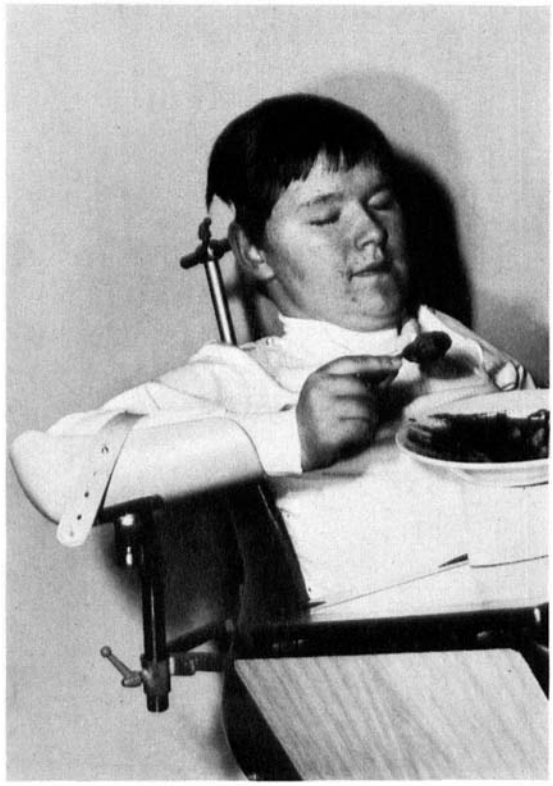

Figure 5. Functional arm-support on elastic rubber joint.

shell (Figure 3). In this position the shell is transferred into the patient's wheelchair, after which he tests it for a certain amount of time.

During the trial the patient is dressed as lightly as possible to give him a better feeling of pressure areas. When the patient and the orthotist are satisfied that no more adjustments are necessary and everything is as comfortable as possible, a positive mold is taken of the shell. It is enlarged on both sides by about 1 cm to allow for clothes. If indicated, Plastazote is placed on the seat, and the mold will then be laminated with polyester-resin as usual (Figure 4).

The brims of the shell can be finished after the resin has set and the shell is ready to be placed into the wheelchair.

In all cases the shell is mounted on a base-plate so that it can also be placed on an ordinary chair or into a car, for example. It also enables us to place the patient in a resting position, if indicated.

Arm- and footrests are fastened directly onto the laminated shell to

Figure 6. Patient (with scoliosis) in his individual molded seat-shell on the wheelchair.

avoid disagreement of angle when the inclination of the shell is changed. Both foot- and armrests are fitted exactly to the patient's requirements (Figure 5). Other aids such as seat belts or head rests can be added if necessary.

Individual molded seat-shells have been fitted in our clinic for the following disabilities: tetraplegia, progressive muscle dystrophy, neural muscle atrophy, meningocele, osteogenesis imperfecta, primary chronic rheumatism, arthrogryposis multiplex and scoliosis of different geneses and varying degrees (Figure 6).

Seat-shells which are individually molded, based on our method, have become a valuable orthopedic aid. They are often indicated, have been tested extensively and are now used with a large degree of reliability by the disabled.

REFERENCES

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Correspondence to:

Prof. Dr. G. G. Kuhn
Abteilung für Technische Orthopädie und Rehabilitation
der Orthopädischen Universitätsklinik Münster
4400 Münster (Westf.)
Robert Koch-Strasse 30
Germany