ABDOMINAL DECOMPRESSION
Its Development and Facilitation of Labour

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(Written with kind permission of Prof. O. S. Heyns, M.A., D.Sc., F.R.C.O.G.: Professor of Gynaecology, The University of the Witwatersrand.)

A system which has been developed after many years of research at the Queen Victoria Maternity Hospital, Johannesburg, S.A., under the direction of Professor Heyns, D.Sc., F.R.C.O.G.

THE DECOMPRESSION UNIT

Patient undergoing decompression

The first time decompression was used in labour was in November, 1955.

Earlier, "in May 1954, in collaboration with Halliday, certain observations were made on the contour of an abdomen, the musculature of which had been paralysed with Scoline". A continuous cinematograph record was made of the changes in the contour of the abdomen during uterine contraction. Two points arose:

1. As paralysis of the diaphragm causes so much distress, it was necessary to use anaesthesia in the form of Pentothal. At this stage the effect of Pentothal on the contraction of the uterus was not known.
2. To be able to record electrical impulses in a stretched abdominal wall, no other means of accomplishing this other than by a contracting uterus were available.

Scoline was used on the first case and the effect was dramatic in that the cervical os dilated with great rapidity—i.e. from a state of being in doubtful labour to three fingers dilated in 68 minutes. The second case—on the 3rd August, 1954—was equally dramatic, thereby proving that the speed of dilation of cervix depended upon a relaxed abdominal wall, or in other words, with a non-resistant abdominal wall cervical dilation was more rapid than usual.

Consideration was now given to the mechanics of the abdominal cavity and its wall. Some method of relaxation of the muscles was sought other than by curarizing and anaesthetic techniques.

At this point (1) Dick Read's method, (2) Hypnotism and (3) Local analgesia—were analysed.

Dick Read's training appeared, contrary to his idea (i.e. tense mind, tense cervix—which incidentally has proved false), to have more effect on general relaxation, thus producing a relaxed abdominal wall also. It was felt, however, that this type of training was nullified in some subjects by anxiety and lack of confidence and understanding.

Hypnotism was again limited to those who may prove to be good subjects.

Local analgesia presented technical difficulties and usually light anaesthesia was also required.

A method was then sought to produce a controlled relaxation of the abdominal wall with a stretch of the abdominal muscles to a greater extent than normally found. Reduction of atmospheric pressure outside the abdomen was then considered. Experiments were conducted with the Kifa type of apparatus applied over the abdomen. It was found that with reduction of atmospheric pressure by a 150 mm. of Hg., retraction of the abdominal wall was impossible. Efforts were then directed to construct a small decompression chamber to fit over the anterior abdominal wall. Difficulties were experienced in acquiring an adequate fit and seal. However, the first parturient was treated with decompression in November, 1955, and on the 15th November there were two cases with spectacular results—one delivering in three hours and the other in two hours and twenty minutes from the start of decompression.

From 1955 to present date, 1961, modifications and perfections of the decompression apparatus have taken a great deal of thought, observation and time. At the present time the apparatus in use is comfortable, practical and relatively inexpensive. Certain modifications, however, may still be required. But already many parturients, primagravidae and others bear testimony of the benefit experienced by decompression in labour in all stages.

The Decompression Unit

The unit consists of four parts: (1) The Suit; (2) The Chair; (3) The Front Piece and Back Support; (4) The Pump.

The Suit

This is designed in strong plastic material like a topless dress in the upper half and a sleeping-bag in the lower half, with an air-tight zip fastener up the middle. The important factor is that the suit fits tightly round the chest, so that during operation an air-tight seal is maintained. The suits are, therefore, made to fit the under-arm chest measurements and each patient to undergo 'decompression' is issued with her own suit.

The Chair

This is designed like a television chair and comfortably supports the head, back, knees and feet. It can either be upright or almost horizontal depending on the patient's preference. The position of the chair is such that the patient is able to relax more easily. One cannot help visualizing rows of chairs in admission wards in maternity hospitals in the future, to be used in the first stage of labour instead of beds which are most unanatomical in design.

The chair has a light tubular steel frame with canvas seat extending down to the feet.

Front Piece and Back Support

The front piece is a large semi-circular device made of fibre-glass and fits over the patient's abdomen onto a concave support placed on the chair behind the patient's lumbar region and hips. This support is a framework only with the middle cut out to allow a lordosis during suit operation which greatly relieves backache.

Pump

The present Hoover Constellation vacuum cleaner pump has been found to be suitable and efficient. The pressure in the suit can be lowered to 50 mm. of mercury below atmospheric pressure within six seconds and thus relief of pain is rapidly obtained. The patient has complete control of the device, and can decrease the pressure at will to a maximum slightly in excess of 100 mm. of mercury as required.

FUNCTION

The unit is used during the first stage of labour for any patient wishing decompression. The patients are given six to eight one-hour runs in the suit prior to the onset of labour at about 36 to 38 weeks. It is thought that the rhythmic periods of decompression find relaxation (i.e. 40 secs. decompression and 20 secs. rest every minute) have the effect of accelerating the physiological changes which occur just before the onset of labour. The patient also becomes acclimatized to the decompression.

What does decompresssion do? During each contraction, as the air is sucked out of the suit and pressure reduced, the abdominal wall is pulled forward about four inches. This allows the uterus to rise up into a position directly over the pelvis and, when contracting, to do so more efficiently as a spherical organ. As the longitudinal fibres of the uterus contract the cervix is gradually taken up. If the uterus is functioning as a spherical organ instead of being indented by the lumber spine posteriorly and flattened by a tense abdominal wall anteriorly, the function is more efficient and the cervix is opened symmetrically and more rapidly.

It is thought that decompression before labour allows for better oxygenation of the foetus, being specially valuable for vital tissues such as the brain, and therefore leads to delivery of a foetus in excellent condition.

USES

(1) To reduce the apparent length and the pain of contractions. The patient does not feel the early part and the end of the contraction, and therefore the length appears less and the peak of the contraction is more bearable.

(2) To relieve severe backache—by producing a lordosis and a very deep inspiratory movement with decompression, the sacro-spinalis muscle becomes greatly stretched at its attachments. This results in the reduction of spasm and relief of pain in the back during labour, dysmenorrhoea and, incidentally, backache of other origins, e.g. 'slipped discs'.

(3) To reduce the time of the first stage of labour—i.e. dilation of the cervix is more rapid.

(4) Special apparatus has been constructed for the application of decompression in the second and third stages of labour. Although a large number of patients have been delivered in this way, this modification is not yet in general use.

Comments by Patients:

"The suit grips the pain and takes it away."

"The backache which was terrific when out of the suit was greatly relieved when returning to it."

CONCLUSION

It is felt that not only can a contribution be made towards the foetal condition at birth as decompression is exerted both ante-natally and during labour, but also that the patient experiences great relief and is often in labour for a much shorter time.

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