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Over-head Extension — One of the Methods of Early Treatment of CDH

Wyciąg ponad głową — jedną z metod leczenia wrodzonego zwichnięcia biodra

INTRODUCTION

In the Orthopaedic University Children's Clinic in Lublin in the period from January 1970 to December 1989 we treated with over-head extension 389 children with CDH. Choosing this method we had three conditions in mind:

- a) adductor contracture is eliminated gently and gradually;
- b) reduction of the head proceeds slowly;
- c) sufficient adaptation of blood supply to the femur head in the flexion and abduction position of hips.

INDICATIONS TO THE METHOD

Over-head extension was the method of treating children with:

- a) completely dislocated hips (388 hips);
- b) hips with subluxation (37 hips);
- c) dysplastic hips with a strong contracture of adductor muscles (23 hips).

One general indication is that over-head extension should be applied in cases when a strong adductor contracture can be observed.

TECHNICAL DETAILS OF TREATMENT

Our method is almost identical with the one presented by American authors (according to Dega). We begin with putting the child on his back (supine position) with hips flexed in 90° and in abduction of $30-40^\circ$. The child's buttocks should be raised over sheets. Gradually abduction is enlarged to $70-80^\circ$ in next days or weeks. In some children inrotation during the extension is applied additionally.

We use the extension for as long time as it is necessary, i.e. for 3—4, sometimes 8—10 weeks. After the first successful reduction of the head into the

acetabulum the child stays on the extension for 1—2 weeks more. It is the prevention of the head necrosis. The whole treatment lasts at least 2—3 weeks. These rules have been observed for the last 5 years. The hip is examined and the chances of reduction are evaluated once a week. Our latest practice is the examination of the child while on extension. Reposition and plastering of the hip in "human position" is performed on the ward, and in cases when percutaneous adductor tenotomy is necessary in the operating theatre. The group with adductor tenotomy count 97 children (25% of all treated patients).

Immediately after final reduction we apply plaster cast for 4—5 weeks. After that time the child receives a Jordan — Hohmann splint, which is removed for bath and exercise. This appliance is used until the full stabilization of the hip is achieved. We can use other methods of physiological abduction (Frejka pillow, Koszla splint, carrying the child with legs wide aparat etc.) until an X-ray shows a good development of the roof.

When we see loose or unstable hips we do not use Pavlik splint, however Pavlik splint finds more and more use in our outpatients clinic in children with only dysplastic or dysplastic contracted hips.

MATERIAL

In the period from January 1970 to December 1989 we treated altogether 389 children (448 hips). Classification into groups depending on the children's age is given in Tables 1 and 2.

Extension was used for a period ranging from 1 day to 13 weeks, average 3.5 weeks. In the last 5 years the time of applying extension was significantly lengthened.

Table 1. Children with CDH in three age groups, time period 1970—1980

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Child- ren's num- ber											
to 6 months	1	3	1	—	1	—	2	3	2	1	2
7—13 months	10	10	2	2	4	3	4	4	3	4	3
over 13 months	6	11	4	5	8	12	7	11	9	7	5
Over-head exten- sion, average time in days	16	21	12	17	19	19	25	33	37	29	30

RESULTS

The time of observation after reposition ranged 2—15 years. Clinical results were evaluated on the basis of the range of movement, length symmetry of legs, symmetry of hips, pelvis and spine.

Clinical results were very good in all children with very good X-rays, good results corresponded to radiological good and sufficient ones. Clinical bad results corresponded to radiological bad ones. Mostly they concerned hips with osteochondrosis.

Radiological results (Table 2) are given according to criteria presented by Piątkowski (3) and those accepted by the 26th Polish Orthopaedic Congress in Poznań (30 September — 4 October, 1986). Examples of X-ray pictures — Figs. 1—4.

Table 2. Children with CDH in three age groups, time period 1981—1989

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989
to 6 months	3	4	9	12	13	10	11	12	15
7—13 months	8	6	7	10	11	9	7	14	12
over 13 months	5	11	4	3	7	11	7	10	8
Over-head extension, average time in days	22	21	24	25	23	27	26	31	29

In the group of bad X-rays and clinical bad results 6 children (7 hips) were reported to have prereposition necrosis in 2—3° according to Tön nis (2). After reposition we observed head necrosis in 1° in 31 hips, 2° in 24 hips, 3° in 3 hips, 4° in 3 hips.

Catamnestic analysis of the whole material showed that in 15 cases treatment was interrupted in a situation when further development of hips was not ended. These hips were selected according to the results of X-ray groups.

In other children (19 hips), the observation period after the reduction was so short (1—6 months) that actual results are not known (Table 3). 61 children, after

Table 3. 389 children (448 hips) treated by over-head extension in 1970—1989

X-ray results	Number of hips
Very good	210
Good	128
Sufficient	30
Bad	61
Without X-ray classification	19

finding bad results, have been called in again for examination and treatment. This group of children is anticipated for a surgery.

DISCUSSION

In 1970s (1970—1974) all children with the possibility of manual reduction of CDH have been put in the plaster cast immediately after the examination. In more than 50% of such children with adductor contracture we observed later head necrosis. So in the next years we decided to treat all the cases by the over-head extension in a longer time. In the last 4 years we tried to treat some of the unstable hips with Pavlik splint, but in some cases we could not achieve a stable hip within few days and those hips were also indicated for over-head extension.

Conclusions

1. Over-head extension is one of good methods of early treatment of CDH,
- 2 The method is safe and it protects against necrosis of the femur head.
3. Reposition achieved on the extension is safe and stable.
4. By lengthening the period of applying extension and atraumatic reposition the results have improved significantly in the last 8 years.

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STRESZCZENIE

W latach 1970—1989 w Klinice Ortopedii Dziecięcej w Lublinie leczono bezoperacyjnie 389 dzieci z wrodzonym zwichnięciem bioder. Wybór tej metody miał na celu: a) powolne pokonanie przykurczu przywodzicieli; b) delikatną repozycję głowy do panewki; c) ochronę głowy kości udowej przed martwicą przez stopniowe przystosowanie krążenia do pozycji zgięciowo-odwodzeniowej biodra. Przedstawiono zasady leczenia i wyniki leczonych 389 dzieci (448 bioder). Rozdział wyników klinicznych: bardzo dobre — 210, dobre — 158, złe — 61 bioder; radiologicznych: bardzo dobre — 210, dobre — 128, zadowalające — 30, złe — 61 bioder.



Fig. 1. Renata M. born 15 VIII 1984, no. 7197; in 17th month of age over-head extension for 49 days. 2.5 years after reposition very good result

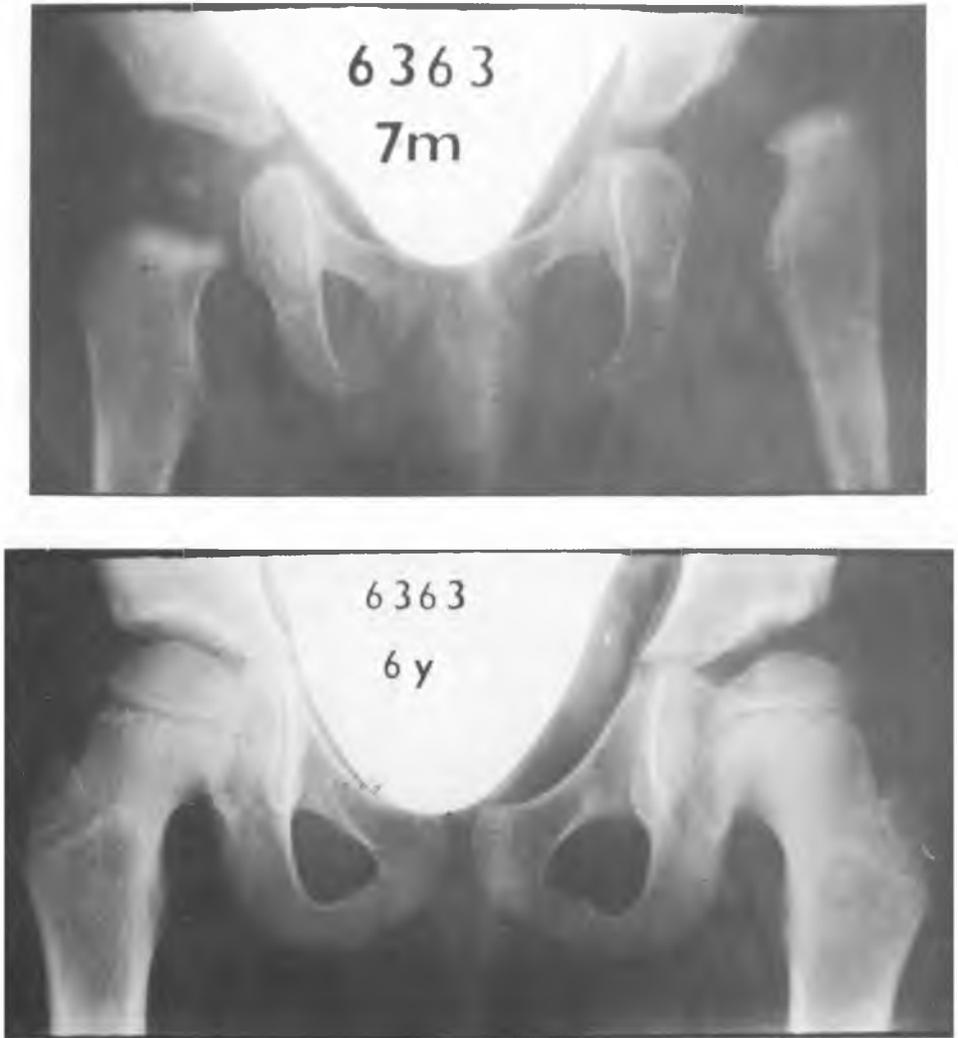


Fig. 2. Ewelina K. born 10 VII 1982, no. 6363; in 7th month of age over-head extension for 26 days, 5.5 years after reposition good result



Fig. 3. Katarzyna K. born 21 I 1982, no. 6193; in 5th month of age over-head extension for 32 days, 5 years after reposition sufficient result



Fig. 4. Monika G. born I III 1982, no. 6169; in 6th month of age over-head extension for 9 days, 6 years after reposition bad result