

## Hypertrichosis in children after immobilization with plaster of Paris

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### ABSTRACT

**Background:** Humans have three different types of hair. Hair growth is a complex process that requires a rich supply of oxygen and nutrients provided by the capillaries that supply the active base of the hair.

**Objective:** To present abnormal growth of hair post prolong immobilization with plaster of Paris.

**Material and methods:** This report is a case series study carried out in Mosul teaching hospital, during the period between (30 Jan 1999 - 30 Sep 2011). The total number of patients treated for developmental dysplasia of the hip (DDH) were 213 patients treated by open reduction), immobilized by plaster of Paris for a period (8 - 16 weeks). Age ranged between (12-48 months) with mean (24.6 months). Females were 164 (77%) and 49 (23%) were males.

**Results:** Patients followed post operatively, abnormal hair growth at the lower limbs was noticed, and hair changes were disappeared completely within 4-6 months.

**Conclusion:** Hypertrichosis is transient, physicians should be aware of its benign nature as it relates to cast immobilization.

**Keywords:** Hypertrichosis, lower limbs, DDH, plaster of Paris.

### نمو الشعر غير الطبيعي في الأطفال بعد استخدام مادة الجبسون في التثبيت

#### الخلاصة

**الخلفية:** للإنسان ثلاثة أنواع من الشعر. نمو الشعر عملية معقدة وتتطلب تزويد عالي بالأوكسجين والمواد الغذائية من خلال الأوعية الدموية الشعرية التي تزود قاعدة الشعر الفعالة.

**الأهداف:** لتقديم ظاهرة نمو الشعر غير الطبيعي بعد لإستخدام الطويل لمادة الجبسون في تثبيت الأطراف.

**المرضى وطرق العمل:** هذه الدراسة هي دراسة حالات متسلسلة، أجريت في مستشفى الموصل التعليمي خلال الفترة بين ٣٠ كانون الثاني ١٩٩٩م و ٣٠ أيلول ٢٠١١ م. العدد الكلي للمرضى الذين عولجوا لتعديل خلع مفصل الورك الولادي كان ٢١٣ مريضاً بطريقة فتح المفصل جراحياً، وأعقب الجراحة تثبيت المفصل بإستخدام مادة الجبسون لفترة ٨-١٦ أسبوع. أعمار المرضى تتراوح بين ١٢-٤٨ شهراً بمعدل ٢٤,٦ شهراً، كان منهم (١٦٤) أنثى و (٤٩) ذكر.

**النتائج:** المرضى تمت متابعتهم بعد العملية حيث لوحظ نمو شعر غير طبيعي في الأطراف السفلى، وتغييرات الشعر هذه إختفت بشكل تلقائي وكامل بين (٤ - ٦) أشهر.

**الاستنتاج:** أن نمو الشعر غير الطبيعي بعد إستخدام مادة الجبسون هو مؤقت وهو غير مدعاة لقلق الأطباء كونه حميد في طبيعته ومؤقت ومرتبب بإستخدام مادة الجبسون.

Humans have three different types of hair: Lanugo, the fine, unpigmented hair that covers nearly the entire body of a fetus, Vellus hair, the short, downy, "peach fuzz" body hair (also unpigmented) that grows in most places on the human body. Terminal hair, the fully developed

hair, which is generally longer, coarser, thicker, and darker than vellus hair, and often is found in regions such as the axillary, male beard, and pubic (1). Unlike other mammals, hair growth and loss is random and not seasonal or cyclic. Hair growth passes through different stages, Catagen,

Telogen, Anagen<sup>(2)</sup>. Hair growth is a complex process that requires a rich supply of oxygen and nutrients provided by the capillaries that supply the active base of the hair. Hypertrichosis may be generalized or localized, congenital or acquired. Hypertrichosis refers to increased vellus hair and is unrelated to androgen excess<sup>(2)</sup>. This is in contrast to hirsutism, localized hypertrichosis has been reported following topical use of hydrocortisone and in mentally retarded patients who repeatedly bite or scratch their hands or arms following chronic irritation, friction, or inflammation<sup>(2)</sup>. Cutaneous hyperemia resulting from infection or trauma may result in the growth of long and coarse hair at the affected sites. The sudden appearance of excessive hair growth in a localized body area following a fracture or cast application has rarely been reported<sup>(3)</sup>. Hair grows from small organs (follicles) located within the complex microenvironment of the skin which has multiple layers of tissue<sup>(4)</sup>.

The aim of study is to present abnormal hair growth in children immobilized with plaster of Paris for long times.

## PATIENT, METHODS AND RESULTS

In department of orthopedic, at Aljumhoori teaching hospital, 213 patients who were operated upon for treatment of developmental dysplasia of the hip (DDH) by open reduction, between (30 Jan 1999 - 30 Sep 2011), their ages ranged between (12-48 months), mean (24.63 months); 49 males (23%), 164 female (77%). Operations done through modified Somerville surgical procedure for treating developmental dysplasia of the hip (DDH) by open reduction followed by derotation femoral osteotomy or pelvic osteotomy, immobilization by plaster of Paris for a period (8-16 weeks) depending on surgical finding and follow up, (Fig. 1).

After removal of plaster of Paris, dark, coarse, long hair was noted; the hair growth was particularly profuse near the knee and it differs in both length and texture from that of the normal leg, (Fig. 2).

In cases of bilateral DDH, where both sides operated on at different times, with immobilization applied for both hips in full spica, when plaster of Paris was removed after 16 weeks, profuse, dark, coarse, long hair on both lower limbs was noted. The hair growth did not differ between the right and

left lower limbs, but was abnormal when compared with the upper limbs (Fig. 3).

Three months later resolution of the hypertrichosis started (Fig. 4). Complete spontaneous resolution of hypertrichosis was noted 6 - 12 months after cast removal.

Abnormal coarse hair varies in consistency, and distributed according to the laterality. In case of unilateral hip spica hair changes appear clearer in comparison with normal lower limb. In case of both lower limbs the hair appeared more profuse (Fig. 5 & 6).



Figure 1. Photograph of child with right hip dislocation, immobilization with plaster of Paris.



Figure 2. Photograph for female child post management for the right hip coarse skin hair appears in the picture while absent hair on the left lower limb.



Figure 3. Photography of both lower limbs with clear evidence of abnormal profuse hair growth for female child.



Figure 4. Photograph for female patient 5 months later, hair started to change to normal.



Figure 5. Photograph for female with profuse distribution of the hair look more around the site of surgery, genitalia was involved also.



Figure 6. Photograph for same female patient with profuse distribution of the hair with extension around both legs.

### DISCUSSION

Our study revealed clear evidence of abnormal excessive growth of hair along lower limbs. This hairy change was clearly observed after treatment with spica immobilization. Probably local heat produced, affects the vascularity of the skin which leads to hair growth in an abnormal manner. Similar to our findings<sup>(3)</sup>, Dorothea mentioned in his study, common type of circular plaster cast was applied, and over the next 7 weeks there were cast changes. Following removal of the cast a localized area of long, coarse dark hair extended almost to the knuckles on the dorsal aspect of the hand; the hair differed in both texture and pattern of growth from that over the right wrist<sup>(3)</sup>. Because of its transient nature, aggressive investigations are definitely not indicated.

Heat and cutaneous hyperemia are acknowledged by dermatologists as definite stimulants of the hair follicle. Although regional blood flow to a long bone is increased following a fracture, cutaneous hyperemia is definitely a transient phenomenon and may be responsible for the transient hypertrichosis. However because this condition is transitory reaction, hormonal studies to date have not been confirmatory. A suggestion that hypertrichosis may be related to reflex sympathetic dystrophy is also not substantiated in the orthopedic literature<sup>(4-10)</sup>.

Gunilla<sup>(11)</sup> explained that, mediators of paracrine and autocrine interactions trigger intracellular signals that are transmitted to the nucleus, where the activation of specific transcription factors

establish and propagate proper epithelial-mesenchymal interactions help in growth of hair in the skin.

In conclusion, the hypertrichosis follow prolong immobilization is transient, physicians should be aware of its benign nature as it relates to cast immobilization.

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