Fracture femur: a clinical sign of child abuse, a case report in a 3 month old infant

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A 3 month-old infant presented with right leg weakness for two days. He was normal since birth, well nourish and well development for age. He was looked after by a baby-sitter from a private company. He was unhappy, cry all the time. On examination, he was alert, normal tone, unable to weight on right leg, asymmetry of tendon reflexes, tenderness at right knee, no sign of inflammation. X-ray at right leg showed fracture at lower part of femur which will be present. Other laboratory findings were normal. Child abuse was diagnosed and management.

Key words: Child abuse, Fracture femur.

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เด็กกระทำทางรุน อาจเป็นได้ทั้งการกระทำรุนกรรมทางกาย ทางอารมณ์ การกระทำทางรุน
ทางเพศ และการถูกทำร้าย ซึ่งจะเกิดขึ้นตามวัฒนธรรมของแต่ละประเทศ

รายงานผู้ป่วย ราย อายุ 3 เดือน ซึ่งเป็นเด็กคลอดปกติ ได้รับการเลี้ยงดูโดยวิมานการ จน
กระทั่งอายุ 2 เดือน ได้ให้พัฒนาลึกลงจากบริเวณเราเท่านั้นเล็กได้ต้าน 1 เดือน เด็กเกิดอาการ
ไม่ใช่ช้า 1 เดือน รับก่อนมาจากพยาบาล ซึ่งเป็นการได้รับอาการจากเด็กที่เกิดปฏิกิริยาพาเวลและหลังจาก
นั้นเด็กไม่ยอมใช้ช้า ชาวจีน การตรวจดูสภาพโดยเด็กเกิดปฏิกิริยาพาเวล ไม่มีอาการติดต่อหรือตาม
มีหวัง การรู้สึกดี พบความผิดปกติเฉพาะที่ช้า พบบริเวณหัวเข่า บริเวณสะโพกสะบังบริเวณ
เข่าต่อมบริเวณปากพนิษได้ เด็กจะร้องมากเมื่อถูกกีบริเวณหน้าเข่า ตรวจ X-ray ขาขวาพบกระดูกของ
กระดูกพิษเมอร์ส บริเวณส่วนปลายผ่าที่ 2 ด้าน ซึ่งเป็นเด็กเกิดที่พบบ่อยในกลุ่มเด็กเล็กที่ถูกกระทำ
ทางรุน โดยถูกกระทำโดยกลุ่มแรก

การรักษาได้ใส่เสื้อให้กับผู้ป่วย และปฏิบัติช่วยเด็กตรงรูทพิษเมอร์สที่ส่งพัฒนา

ร้อยละ 50 – 75 ของกระดูกพิษเมอร์สทำให้เด็กเด็กต่อมต่อมากกว่า 2 ปี พบในกรณีที่เด็กกระทำทางรุน
มากกว่าอุบัติเหตุ ดังนั้นเมื่อพบเด็กที่มีกระดูกทำในบริเวณที่ไม่ควรเกิดขึ้น ควรติดตามเหตุของการทำ
และตัวแปรที่ทำจะเป็นข้อมูลในการวินิจฉัยที่ถูกต้องต่อไป
Child abuse

The term “child abuse” encompasses a spectrum of disorders ranging from the well documented physical and sexual abuse to emotional abuse, neglect, deprivation and abandonment. It is prevalent throughout the world with the presentation frequently differing in different cultures.

Reports of all types of abuse increased 50% from 30 per 1,000 children to 45 per 1,000 between 1985 - 1992. Childrens protective services (CPS) reported in 1992 about 2.9 million cases. Of the reported children, 85% were younger than 5 yr of age and 45% were younger than 1 year of age.1

In Thailand, the reports of child abuse are underestimated. A report from 24 government and non-government organization indicated that abused child cases increased from 423 in 1995 to 617 in 1997.2

In 1992, the CPS reported 28% of 797 reports were for physical abuse and the death rate was 6%. The most common perpetrators were the father (21%), mother (21%), boyfriend of the mother (9%), babysitter (8%) and step - father (5%).1

Principles in diagnosis of child abuse

- Cutaneous lesion : bruising
  - local erythema or bullae
- Ocular findings : retinal hemorrhage conjunctival hemorrhage orbital swelling
- Hematuria
- Acute abdomen damage
- Osseous lesions : fractures (multiple or in various stages of healing)
  - metaphyseal or epiphyseal lesions
  - subperiosteal ossification

Nowadays, many Bangkok couples prefer using a babysitter to look after their baby at home while they both work. Without love and responsibility, the baby can be abused anytime.

We report a very young infant of 3 months with a history of acute monoplegia and demonstrated fracture sites of the long bone caused by child abuse.

Case report

A three month old male infant presented with right leg weakness for 2 days. He had done well since birth, was well nourish and had normal development. Immunizations were complete for his age. There was no history of fever or running nose before presentation. He was a first child of a young couple, father aged 28, mother aged 25, both working in their own company. The baby was looked after by a baby - sitter from a private company for one month. He was forced to sit at the potty on the day he developed the leg weakness.

Physical examination

- general examination : normal, no bruises on skin

Neurological examination

- normal head contour
- no bulging anterior fontanle
- normal tone of muscles at upper extremities and left leg
- asymmetry of deep tendon reflexes at knee jerk :
  - Rt = 0, Lt = 2+
- tenderness at right knee
- clonus negative
- plantar flexion on Babinski sign
Laboratory findings

<table>
<thead>
<tr>
<th>Electrolytes</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>Na</td>
<td>140 mmol/L</td>
<td>(135-145)</td>
</tr>
<tr>
<td>K</td>
<td>4 mmol/L</td>
<td>(3.5-5.1)</td>
</tr>
<tr>
<td>Cl</td>
<td>100 mmol/L</td>
<td>(98-106)</td>
</tr>
<tr>
<td>CO₂</td>
<td>24 mmol/L</td>
<td>(22-29)</td>
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<tr>
<td>Ca</td>
<td>10 mg/dl</td>
<td>(8.1-10.4)</td>
</tr>
<tr>
<td>PO₄</td>
<td>4.5 mg/dl</td>
<td>(2.5-5)</td>
</tr>
</tbody>
</table>

Discussion

It is difficult for a clinician to distinguish abuse from accidents, so the criteria used by the clinicians to distinguish abuse from accidents are:

**Definite abuse**
- Positive skeletal survey
- Multiple recent fractures
- Positive skeletal survey
- Fractures of various ages
- Eyewitnesses

Figure 1. Rt. leg X-ray: demonstrate fracture site at lower part of Rt. femur both corners.
- Multiple internal injuries
- Physical findings
- Bruises (caused by hand, electric cords, teeth)
- Suspicious or unexplained burns or scars
- Sibling abused at same time
- A definite intentional act causing physical harm to the child
- Suspicious injury with definite later abuse
the criteria used by the radiologists to
distinguish abuse from accidents are:
- Serious trauma must have been involved,
not reflected in history
- Serious trauma must have been involved,
suspicious delay in reporting
- Multiple fractures found, not explained by
history
- Healing fractures found, not explained by
history

Fractures considered to have a high specificity for
abuse:
- Metaphyseal fractures
- Rib fractures
- Scapular fractures
- Fractures of the outer end of the clavicle
- Vertebral fractures or subluxation
- Digital injuries in non-mobile children
- Bilateral fractures
- Complex skull fractures

- Their incidence has been variously reported
as between 11 – 28 %
- More common in the lower limbs around the
knees and ankles

Femur fractures
Femur fractures have been said to “always”
be due to abuse unless proven otherwise. 50 – 75 %
of femur fractures were from abused children younger
than 2 years of age and all children with femur
fractures were followed closely with carefully history
taking.

Cause of femur fractures
(n = 25) by age group

<table>
<thead>
<tr>
<th>Consensus</th>
<th>Rating</th>
<th>0 - 11</th>
<th>12 - 23</th>
<th>24 - 35</th>
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</thead>
<tbody>
<tr>
<td>Abuse</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Accidental</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

September 1991: 471-476)

In our case, the fracture site was at the corner
of the lower part of the Rt femur which was a common
site of fracture from child abuse. The baby was
treated with an early spica casting because this
method has been successful and is associated
with few complications in children younger than 5
years.

Thailand is one of the countries which signed
the Convention on the Rights of the Child on 12th
February 1992. The convention entered into force in
Thailand on 26th April 1992.

Metaphyseal Fractures
- Also known as corner or bucket handle
fractures, have been well described in the literature
and are regarded as highly specific for abuse.
In Thai society, parents have duties and moralities to raise their children according to their ability. The duties of parents to bring up the children are specified in section 1,564 of the civil laws stating that “Parents must raise and provide education for their children as deemed appropriate during his or her childhood years”.

Violations of child rights in various forms have occurred in society and caused child suffering to the extent of death, illness or becoming crippled. Protection of child rights is, therefore, a must and it requires collaboration among those who are involved whether families, members of society and governmental and non-governmental organizations. Such collaboration is perceived to be necessary to prevent and protect children from being abused or exploited. It is also to ensure that children are properly raised and develop a healthy growth physically, mentally, emotionally and socially such that they become productive human resources in the future. (17)

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