

## **A Radiographic Study on the Time of Fusion of the Ossification Loci Around the Elbow Joint of the Patanwadi Sheep**

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### **ABSTRACT**

**A radiographic study of the ossification process of Trochlea humeri, Epicondylus medialis (humeri), Caput radii and Tuber olecrani was done in twenty two healthy Patanwadi sheep ranging from two months to twenty six months of age and reared under identical optimum conditions. Trochlea humeri got fused with shaft at the age of six to seven months while Epicondylus medialis got fused at the age of 11 to 12 months, Tuber olecrani got fused at the age of twenty four to twenty six months and Caput radii got fused with the shaft at the age of eight months.**

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### **INTRODUCTION**

The use of radiography to study the fusion of the epiphyses of the animals is a fairly recent innovation although it has been used extensively over a long period for man (Smith and Allcock, 1960). Developmental growth can be measured in three ways viz., by weight, stature and skeletal maturation. The skeletal system is particularly amenable to measurement throughout the growth period by radiographically detectable qualities (Chapman, 1965).

The norms established help the animal production profession to ascertain normal growth rate and establishment of age in particular breed. It also helps the veterinarian to diagnose pathological conditions of the skeleton.

Since the breed variation affects the process of ossification and as there was no such record in Patanwadi Sheep, the present work was undertaken.

### **MATERIALS AND METHODS**

Twenty two sheep of Patanwadi breed from the Instructional Farm of the Gujarat Agricultural University, Campus-Anand, ranging in age from two months to twenty six months and reared under identical, optimum conditions were utilized for the study. They were healthy and exact age was available from the records. Elbow joints were radiographed in medio-lateral position on high speed Indu X-Ray films using T-101 Escorts India Ltd. diagnostic X-Ray machine.

The terminology used in this study was taken from Nomina Anatomica Veterinaria (1968).

### **RESULTS AND DISCUSSION**

As per Walter's (1956) classification the Trochlea humeri and Caput radii fall under pressure epiphysis while Tuber olecrani falls under traction epiphysis.

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1. Research Associate (Surgery)

All the four ossification loci were seen without fusion at the age of 2 to 3 months (Fig. 1).

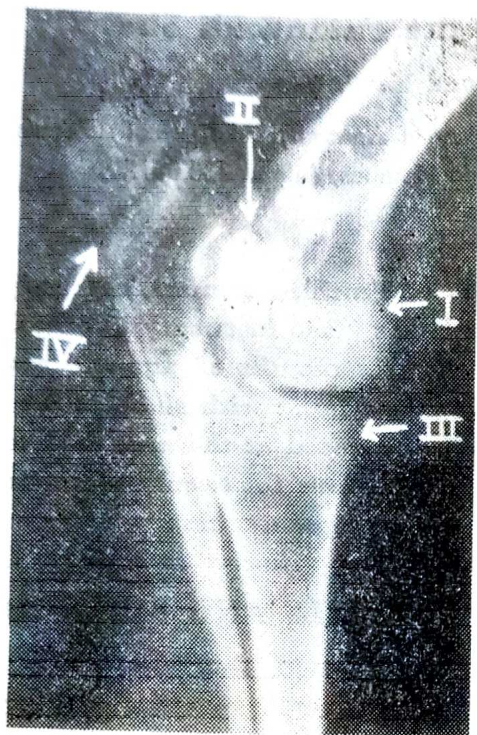


Figure-1.

**Age: 2-3 months-** Arrows point at the open loci viz., (I) Trochlea humeri, (II) Epicondylus medialis, (III) Caput radii (IV) Tuber olecrani.

### **Trochlea humeri :**

Trochlea humeri got ossified in the present study at the age of 6 to 7 months (Fig. 2). Dhingra (1976) reported it to be taking place at the age of 5 to 8 months in Banuur x Nali sheep. Smith (1956), Todd and Todd (1936), Lesbre (1897), and Tschirwinsky (1880, 1910) reported it to be 4 months, 8 months, 3-4 months and 3 months respectively in exotic breed of sheep.

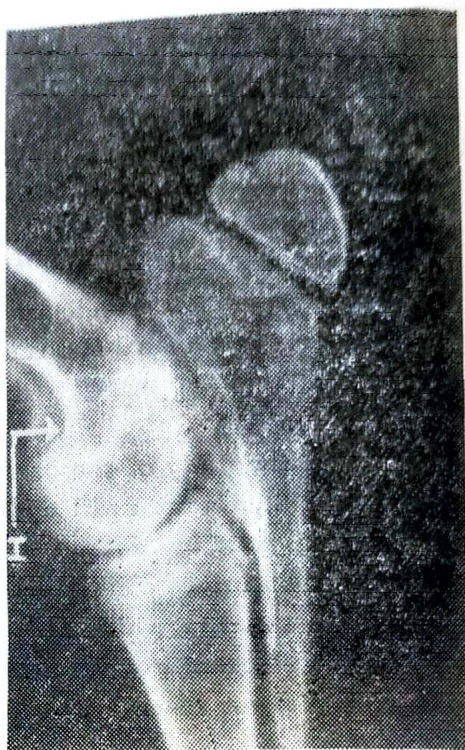


Figure-2.

**Age: 6-7 months.** Arrow points at the fused Trochlea humeri (I).

**Epicondylus medialis (humeri):**  
This locus got ossified with the

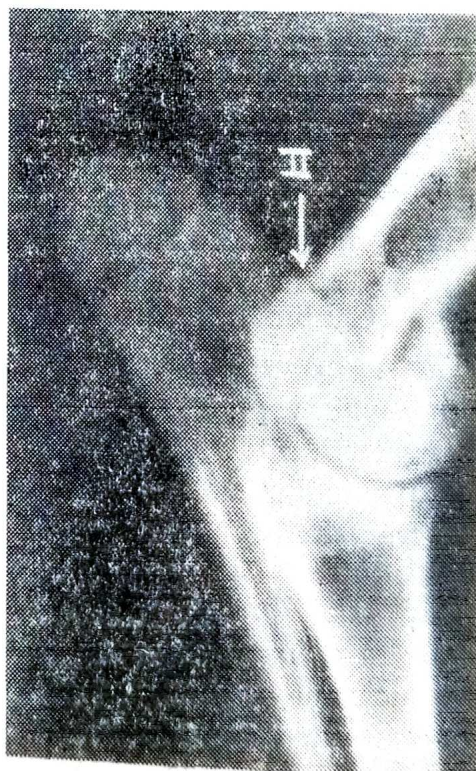


Figure-3.

**Age: 11-12 months.** Arrow points at the fused Epicondylus medialis (II).

shaft at the age of 11 to 12 months in Patanwadi sheep (Fig. 3). According to Dhingra (1976) it got ossified at the age of 8 to 11 months in Banuur x Nali sheep while Smith (1956) reported its fusion with the shaft at the age of 6 months in the exotic sheep.

#### Caput radii :

The age for the complete ossification of Caput radii was found to be 8 months in the Patanwadi breed (Fig. 4). Dhin-

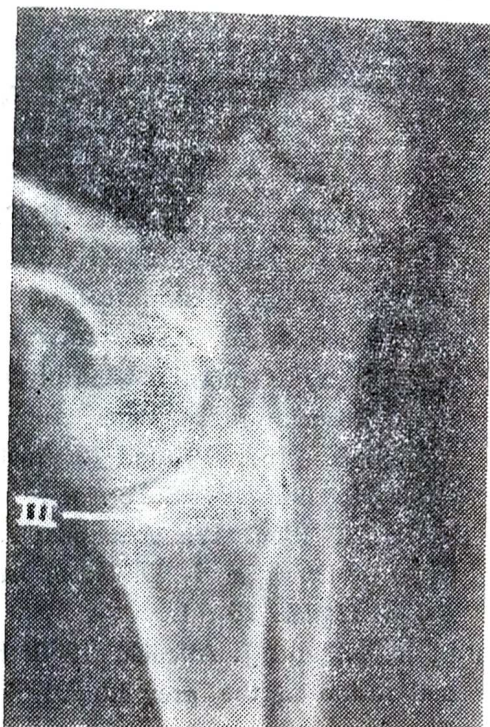


Figure-4.

**Age: 8 month. Arrow point at the fused Caput radii (III).**

gra (1976) reported it to be 8 months in case of Banuur x Nali sheep. While Smith (1956). Todd and Todd (1936), Lesbre (1897) and Tschirwinsky (1880, 1910) reported it to be 4 months; 6 months; 3-4 months and 3 months respectively, in the exotic sheep.

#### Tuber olecrani:

Tuber olecrani got ossified at the age of 24-26 months in the present study (Fig. 5). Dhingra (1976) reported

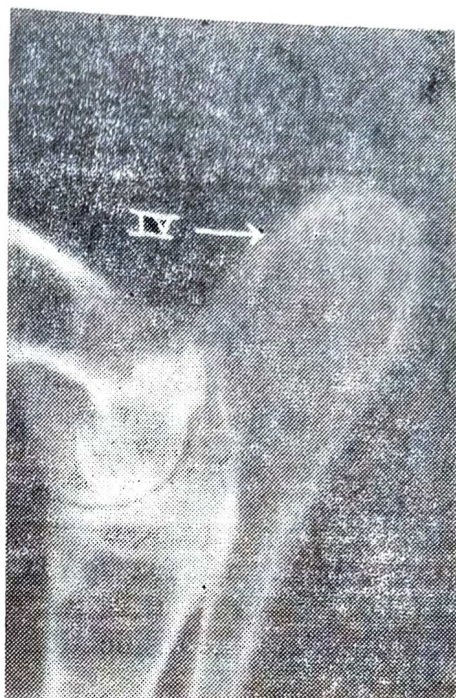


Figure-5.

**Age: 24-26 months. Arrow points at the Fused Tuber Olecrani (IV).**

it to be 27-41 months in Bannur x Nali sheep. While Smith (1956) and Lesbre (1897) reported it to be 21 months and 36-42 months respectively, in exotic sheep.

Skeletal maturation is a good indicator of the state of nutrition and health of an animal. Further, appearance of the epiphyseal centres and closure of the epiphyseal plates at unusual times may indicate hormonal abnormalities of the pituitary gland, the thyroid gland, or the gonads. Renal diseases by their influence on calcium metabolism may also affect the radiographic appearance of the ossification centres (Morgan, 1972).

Comparing the present data with other workers it is obvious that the ossification of the epiphyses occur at an early age in exotic sheep then in the Patanwadi sheep. There is no much difference in fusion of these loci between the Patanwadi breed of present

study and Banuur x Nali sheep reported by Dhingra (1976). However, Tuber olecrani got ossified earlier in Patanwadi sheep than that of Banuur x Nali sheep. These variations may be due to the difference in breed. Even within a breed closure time of the particular epiphysis may differ from one individual to the other (Walter, 1956).

In the present study the influence of sex on the ossification time was not evaluated. Dhingra (1976) and Kirton *et al.* (1976) reported that the process appeared more advanced in female sheep than in the male sheep. However, Hare (1961) reported that sex did not seem to influence the ossification process in the dog.

The results have shown that by radiographic study of the development of these ossification centres, it is possible to determine the degree of bone maturity in relation to the age of the animals and to predict the approximate age in the animal, where the exact date of birth is not available. On account of elimination of the effect of the extrinsic factors like nutritional deficiency, hormonal imbalance and metabolic disorders, these radiographic norms of the epiphyseal ossification may be utilized to study the possible effects of the above said extrinsic factors on the process of epiphyseal ossification in Patanwadi sheep.

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