

## The frequency of ossification of the sacrococcygeal joint in Iraqis.

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### **Abstract**

Sacrococcygeal joint fusion incidence has been studied at Forensic Medicine Department of Tikrit Teaching Hospital in Salah-Aldin governorate, One hundred body of equal number from males & females had been dissected as autopsy, sacrococcygeal joints were explored, freed from soft tissues, fusion of joints (ossification) was more prevalence in males (68%) than females (48%).and the incidence was high in aged than young people.

**Key words:** Ossification, Sacrococcygeal joint.

### **Introduction**

The sacrococcygeal joint is a secondary cartilaginous (symphyseal) joint, between the apex of the sacrum and the first vertebral segment of the coccyx. It contains a thin intervertebral disc and is reinforced all round by small band-like sacrococcygeal ligaments, including the fibers between the inferolateral angles of the sacrum and the transverse processes of the first coccygeal vertebra (lateral sacrococcygeal ligaments) and the fibers between the sacral and coccygeal cornua (intercornual ligaments)(1). The movements at the sacrococcygeal joint are restricted to flexion and extension (2). Movement of the coccyx in a forward direction (flexion) is performed by the levatores ani and the sphincter ani externus muscles. This movement increases the normal anorectal flexure by which the descent of the faeces can be controlled. Movement in a backward direction (extension) is due to relaxation of these muscles and to the increased intra-abdominal pressure which occurs during defecation and, more especially, during parturition (3).

Many anatomical textbooks state that the sacrococcygeal joint may be obliterated by ossification with resultant fusion of the first coccygeal segment with the apex of the sacrum (4, 5, 6 & 7).However; there is a paucity of information regarding the incidence of sacrococcygeal fusion. The few statements proffered on the subject are vague and conflicting. For instance, it has been claimed to

occur in 'elderly persons' (7), 'advanced age' (8), 'old age' (5) and at a 'late period of life' (4). According to (9), bony fusion may develop 'after the age of 30'. On the other hand, Perkins (10) maintains that a fibrous intersection persists throughout life between the sacrum and the coccyx although the coccygeal elements may fuse with each other to become a single bone. Controversy also surrounds the question of sex differences in the occurrence of sacrococcygeal fusion. A higher incidence in males (3), while Williams (4) claims that elderly females are the most susceptible; but Breathnach (9) writes that 'fusion is said to occur later in women'.

None of the foregoing reports provide any incidence rates, so the present report describes a quantitative study of sacrococcygeal fusion in osteological material of documented age and sex.

### **Materials And Methods**

The material used for this study comprised 100 adult bodies (50 males and 50 females), of different Iraqi geographical origins; their ages range from 20 to 69 years. The sacrococcygeal joints were examined at Forensic Medicine Department of Tikrit Teaching Hospital in Salah-Aldin governorate and these cadavers collection of documented age and sex. All the sacrococcygeal joints were sufficiently intact ( pathological and

traumatized joints were excluded) to show the presence or absence of sacrococcygeal fusion, regional dissection releasing the joints from muscles, tendons and ligaments soft tissues , sometimes examining demands cutting and lifting lower part of sacrum with whole joint for better checking .

## **Results**

Cases of sacrococcygeal fusion were found in regarding to both sexes frequency were found more among the males than females. The incidence of ossification joints in males was 34 cases out of 50; while in females was 24 cases out of 50. Generally the ossification joint incidence percentage was 58%. While in regarding to the age, it was found that the incidence of sacrococcygeal joint fusion increase proportionally with age especially in cases those above the fifties.

Table (1), shows the incidence of sacrococcygeal fusion in relation to sex; while Table (2), shows the fused joints which were founded in all ages presented groups, from the third to the seventh decade. At the third decade the table shows equal & low incidence proportion, on progressing of the age, the incidence becomes more prevalence among males particularly those above sixties.

## **Discussion**

This study reports the occurrence of sacrococcygeal fusion in adult skeletal autopsy derived from different Iraqi geographical regions of populations.

Instances of were sacrococcygeal fusion found in both sexes and in all the decades of life represented in the sample, from the third to the seventh. The youngest case occurred in a 22 years old female & in adult was in 69 year old male.

The results of this investigation do not support the general view of Pick, Romans & Moore (8, 5 & 7 respectively) that sacrococcygeal fusion is peculiar to old age. Refuse the claims that ossification occurs not at all as in Perkins (10) or only after the age of 30 years old which demonstrated by Breathnach (9).

High rates of sacrococcygeal fusion were found in males (68 %); the frequency distribution of sacrococcygeal fusion supports the claim of Smour (3) that males are more susceptible. But the findings disprove the finding that the onset of sacrococcygeal fusion is delayed to later life in females as an adaptation to the functional requirements of the pelvic outlet as mentioned by Breathnach (9). The results indicate that the reverse may occur, namely that fusion may be delayed in males. Females showed virtually low incidence rate (48%) than males. The present study did not agree with Williams (4) that stated the sacrococcygeal fusion is most common in elderly females.

Lumley (11) reported that the sacrococcygeal joint may be dislocated during childbirth, but did not indicate whether such trauma could lead to bony fusion. However, it is acknowledged that an ossified sacrococcygeal joint decreases the potential antero-posterior diameter of the pelvic outlet, thereby impeding the expulsion of the fetus as Smour (3) reported. In the present study, the common occurrence of sacrococcygeal joint fusion in women of multipara suggests obstetrical risk is more prevalent. Environmental and/or genetic factor nature might conceivably act by affecting anatomical features which changes the angulations of the coccyx with the sacrum or the morphology of the intervertebral disc.

In putting side by side to Saluja (12) finding, results of the present study confirm the common incidence in both sexes which he found in Aberdeen & London groups, but with high incidence in males. Also corroborates his findings about females in London group.

## **Conclusions**

It is well known that the sacrococcygeal joint may be obliterated by ossification, producing fusion of the first coccygeal segment with the sacrum. There is a conspicuous lack of quantitative information on the occurrence of such bony fusion. It is generally regarded to be characteristic of old age.

This report describes the occurrence of sacrococcygeal fusion in both sexes with a high

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incidence in males (68%) than females (48%). Also, it demonstrates prevalence of ossifications in aged populations than youngest people (under third decade); both males and females had a similarly high incidence.

In the males exhibited high rate whereas the females showed a relatively low occurrence.

The findings of this investigation indicate that the occurrence of sacrococcygeal fusion is related exclusively to age and sex. It is postulated that other factors of a genetic and/or environmental nature are involved.

**Table (1):** show the number of individuals with and without sacrococcygeal joints fusion regarding sex.

	Male	Female	total	percentage %
Number of individuals without sacrococcygeal fusion	16	26	42	42%
Number of individuals with sacrococcygeal fusion	34	24	58	58%
Total	50	50	100	100%

**Table (2):** shows the number of fused joints distributed between males & females according to the age.

Groups of age in years	male	Joint NO. fusion	percentage %	female	Joint NO. fusion	percentage %	Total Joint NO.	Total Joint NO. fusion	percentage %
20-29	10	2	4%	10	2	4%	20	4	4%
30-39	10	7	14%	10	4	8%	20	11	11%
40-49	10	8	16%	10	4	8%	20	12	12%
50-59	10	9	18%	10	7	14%	20	16	16%
60-69	10	8	16%	10	7	14%	20	15	15%
20-69	50	34	68%	50	24	48%	100	58	58%

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