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Scan Aspects of Transitional Abnormalities of the Lumbosacral Spine at the Medical Imaging Department of the University Hospital Pr Bocar Sidy Sall de Kati

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Abstract **Original Research Article**

***Introduction*:** Lumbosacral transitional abnormalities are fairly common birth defects in the general population, with a high prevalence in low back pain patients. The objective was to study the detailed epidemiological and CT aspects of lumbosacral transitional anomalies. ***Materials and Method*:** This was a retrospective cross-sectional study carried out in the Medical Imaging Department of Professor Bocar Sidy SALL University Hospital in Kati over a period of one year (01 July 2021 to 30 June 2022). A siemens somatom emotion scanner of 16 bars was used for the examinations. We used the castellvi classification to classify the different anomalies. ***Results*:** At the end of our study we collected 80 patients with lumbosacral transitional abnormality on 623 lumbar CT performed, a frequency of 12.84%. Lumbosciatica was the first reason for consultation (50%), the average age of our patients was 47 years and the 40-65 age group was in the majority (48.75%) with a male predominance (51%). Sacralization was the most frequent type of transitional anomaly (70%), with a predominance of type IIb, low back accounting for 30% with a predominance of type IIb. The combination of degenerative disc disease, lumbosacral and sacroiliac osteoarthritis was present in 75% of cases, bertolotti syndrome was found in 52.5%. ***Conclusion*:** Lumbosacral transitional abnormalities are common in our region. The scanner allowed us a detailed semiological study of these abnormalities of the lumbosacral hinge. Castelvi's type IIb was the most common.

Keywords: Lumbosacral transitional anomaly, lumbar CT, CHU BSS de Kati.

INTRODUCTION

The lumbosacral transitional anomaly is a congenital malformation characterized by the presence of transverse mega-processes on the last mobile lumbar vertebra, these mega-processes coming into contact with the sacrum and / or the iliac wing sometimes forming an equivalent of joint space [1]. This transitional anomaly corresponds to a morphological variation ranging from partial or complete sacralization to partial or complete lumbation of the vertebra concerned [2]. The usual frequency of transitional abnormalities varies between 4 and 30% in the general population; It is twice as high in a population of low back pain and/or sciatica patients [3]. Most of these malformations are unknown, either because they are asymptomatic or because they are not recognized or misdiagnosed. Some attract attention because they cause rachialgia or because they are associated with abnormalities or even pathologies. Others, because spinal mobility is limited, or because there is spinal instability [4, 5]. The CT scan makes it possible to make an exhaustive morphological analysis of the lumbosacral spine and to have an etiological orientation in front of lower back pain even if the MRI remains the reference examination. While spinal pathologies have been widely studied by many authors, lumbosacral transitional abnormalities in general in Mali have been little studied. This motivates us to undertake this work, the objective of which was to study the detailed epidemiological and CT aspects of lumbosacral transitional anomalies.

MATERIALS AND METHOD

This was a prospective study carried out in the Medical Imaging Department of Professor Bocar Sidy SALL University Hospital in Kati over a period of one year (from 01 July 2021 to 30 June 2022). The variables studied were: age, sex, clinical data and CT aspects. All patients who received a lumbar computed tomography scan in whom a transitional abnormality was objectified were included. Patients with a follow-up examination were not included. A siemens somatom emotion scanner of 16 bars was used for the examinations. The technique consisted of axial acquisition of the lumbar spine without injection of the contrast medium, with coronal, sagittal and volumetric reconstructions. The images were read by a radiologist. The diagnosis of transitional abnormality was made in front of a single or bilateral low back or sacralization. We used the castellvi classification to classify the different anomalies.

Ethical and Deontological Consideration

The collection of data was carried out after obtaining the authorization of the Head of Department with respect for the anonymity of patients and the confidentiality of information.

RESULTS

At the end of our study we collected 80 patients with lumbosacral transitional abnormality on 623 lumbar CT performed, a frequency of 12.84%. The average age of our patients was 47 years and the 40-65 age group was in the majority with 48.75% of cases (Table I). There was a slight male predominance with 51% of cases. Lumbosciatica was the first reason for consultation (50%), followed by low back pain with 26% of cases (Table II). Sacralization was the most frequent type of transitional anomaly (70%), with a predominance of type IIb, low back injury represented 30% with a predominance of type IIb (Table III). The combination of degenerative disc disease, lumbosacral and sacroiliac osteoarthritis was present in 75% of cases (Table IV).

Table I: Distribution of patients by age group

Age range	Effective	Percentage
<=15	1	1,25%
>16 – 40	30	37,50%
>41 – 65	39	48,75%
>66 – 85	10	12,50%
Total	**80**	**100,00%**

Table II: Distribution of patients by clinical information

Clinical Information	Effective	Percentage
Lombosciatica	40	50%
Low back pain	21	26,25%
Post-traumatic assessment	12	15%
Coxalgia	3	3,75%
Functional impotence	2	2,50%
Neurological syndrome	2	2,50%
Total	**80**	**100,00%**

Table III: Distribution of patients by type of transitional abnormality

Type of transition anomaly	Effective	Percentage
Low back hair		
Type Ia	0	00,00%
Type I b	5	20,83%
Type IIa	3	12,50%
Type IIb	**12**	**50,00%**
Type IIIa	0	0,00%
Type IIIb	1	4,17%
Type IV	3	12,50%
Sacralization		
Type Ia	0	00,00%
Type Ib	6	10,71%
Type IIa	14	25,02%
Type IIb	**18**	**32,14%**
Type IIIa	3	5,35%
Type IIIb	7	12,50%
Type IV	8	14,28%

Table IV: Distribution of patients according to the presence or absence of other associated abnormalities.

Other associated anomalies	Effective	Percentage
Degenerative disc disease + lumbosacral osteoarthritis and sacroiliac	60	75%
Degenerative disc disease + lumbosacral osteoarthritis and sacroiliac + isthmic lysis	7	8,75%
Degenerative disc disease + lumbosacral osteoarthritis and sacroiliac + spina bifida occulta	2	2,50%
Spina bifida occulta	2	2,50%
Costalization of L1	4	5%
Vertebral fractures	5	6,25%
Total	80	100,00%

Figures 1, 2 and 3 are the iconographic illustrations showing the transitional anomalies.

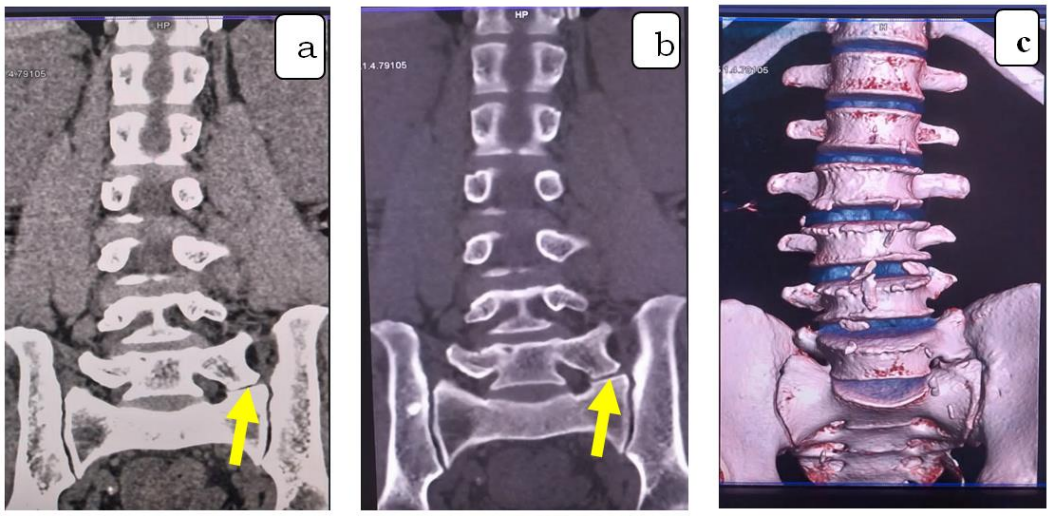

Figure 1: H of 55 years, CT in coronal reconstruction (parenchymal and bone) and 3D objectifying a low back of S1 type II a (arrow)

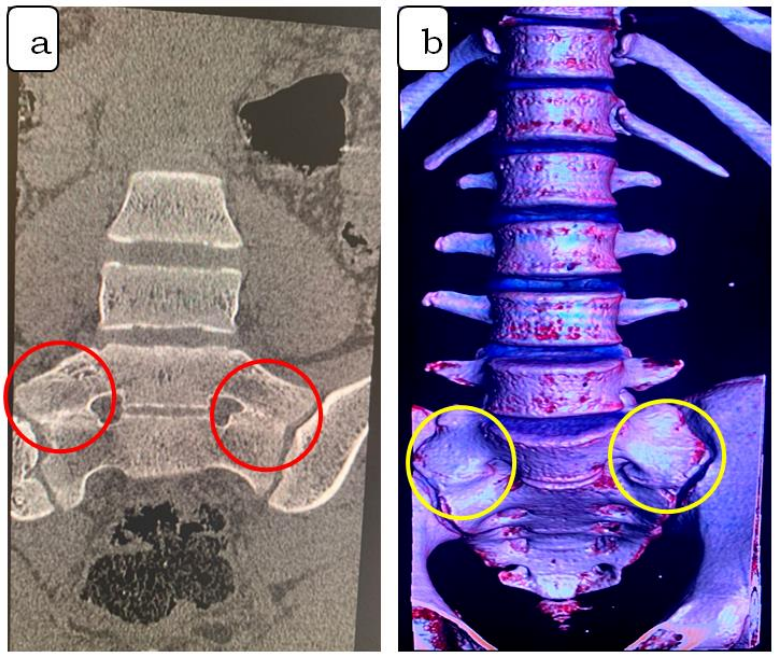

Figure 2: F 46 years: CT of the lumbosacral spine in coronal reconstruction and bony window in (A) and volume (B) highlighting a sacralization of L5 classified type IIIb of Castellvi (ellipses)

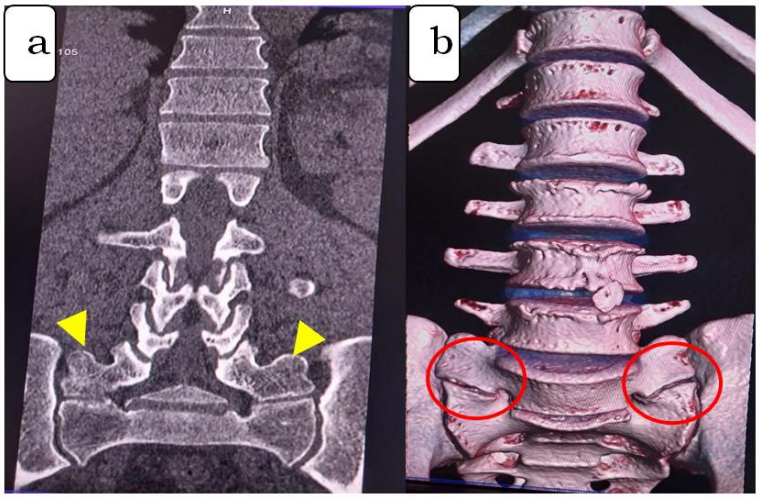

Figure 3: 59-year-old H, lumbosacral spine CT, window coronal reconstruction Figure 3: 59-year-old H, lumbosacral spine CT, window coronal reconstruction bone in (A) and volume seen from the front in (B) showing a low back of S1 classified type IIb of Casellvi

DISCUSSION

Frequency:

From July 2021 to June 2022, 623 patients performed a CT scan of the lumbosacral spine at the medical imaging department of the Pr Bocar Sidy SALL University Hospital in Kati. Eighty had a lumbosacral transitional anomaly or 12.84%. The usual frequency of transitional abnormalities varies between 4 and 30% in the general population; It is twice as high in a population of low back pain and/or sciatica patients [3]. A similar frequency was observed by Coulibaly MO [6] with 12.1% of cases. Transitional abnormalities represented 3.06% in its general population (all patients seen in consultation) 28.2% of low back pain patients.

Age:

In our study the average age was 46.25 years with extremes of 15 to 85 years which is superimposed on that of Sy O [7] and Coulibaly MO [6] which obtained respectively 44.21 years and 48.22 years. On the other hand, the average age was 61 years +/- 9 in Nardo L [8].

Sex:

In the present study, a male predominance (41/39) was found with a frequency of 51%, this same predominance was found in the study of Coulibaly MO [6] and Camara M [9] which found respectively 50.7 and 60.5%. Male predominance has been found in several studies [8, 10], but female predominance has been reported in others [7].

Clinical Information:

In our study, lumbosciatica was the first reason for CT with a frequency of 50%, followed by low back pain at 26.25%. These data contrast with those found by Camara M [9] which had 53% for lumbosciatica and 14% for low back pain. On the other hand, Coulibaly MO [6] and SY O [7] found that low back pain was the first reason for consultation with respectively 36.8% and 63.8% of cases, followed by lumbosciatica 30.20% each. Transitional abnormality may promote early onset of low back pain [7] Lumbosacral transitional vertebrae are positively correlated with the prevalence and severity of low back pain [8].

CT Scans:

Among the 80 patients included in our study, 56 had sacralization or 70% and 24 low back or 30%. This predominance of sacralization has been observed in several studies [6, 7] which had respectively 88.9% and 84.1% for sacralizations, 9.6% and 15.9% for low back injury.

Castellvi's Classification:

In our study, types 2a, 2b and 4 were the most frequent in the lot of sacralizations with respectively a prevalence of 32.14%; 25,02%; and 14.28%. Types 1b, 2b, and 4 were the most frequent in the lot of low back infections with a prevalence of 20.83% respectively; 50%; 12,50%. These results are comparable to those of Nardo *et al.*, [8] and Tang *et al.*, [11], who also reported a predominance of type 1, 2 and 4 of the Castellvi classification.

Other Associated Anomalies:

In the present study, degenerative disc disease associated with lumbosacral and sacroiliac osteoarthritis was the most common pathological association with 75% of cases. This result is close to that of Coulibaly [6] which reported 50% of discovertebral degenerative phenomenon.

CONCLUSION

Lumbosacral transitional abnormalities are common in our region. The scanner allowed us a

detailed semiological study of these anomalies. Sacralization was dominant and disc disease was mostly associated. Castelvi's type IIb was the most common.

CONFLICT OF INTEREST

The authors declare that they have no conflict. They all contributed to the drafting of this document.

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