

CLASSIFICATION



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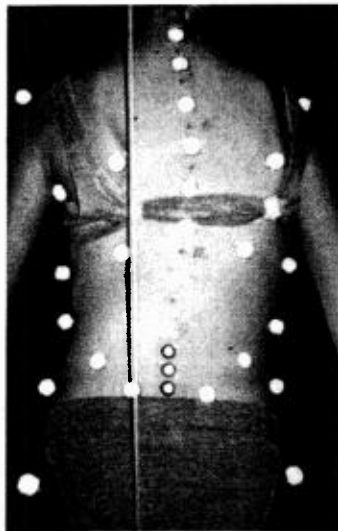
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RIGHT THORACIC TYPE I (RT1)

PHOTOS: Right Thoracic Type I

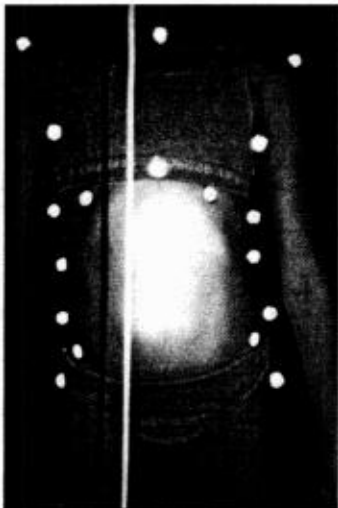
Back view:

This patient presents a postural disorganisation typical of Right Thoracic Type I scoliosis. Please note that this scoliosis is already relatively significant since the Cobb angle is 36°.



- A slight frontal counterclockwise tilt of the shoulder girdle, particularly pronounced by a dropping of the left scapula which is flattened, and a slight elevation of the right scapula which is detached.
- The kyphosis is diminished clinically.
- There is an upright right thoracic prominence, emphasized when bending forward, which corresponds to a clockwise rotation of the thorax in the horizontal plane.
- There is a right lateral shift of the trunk.
- The orientation of the pelvis is only slightly modified, generally the left iliac crest appears more open than the right one, which gives the impression of a more prominent left hip.

Front view:



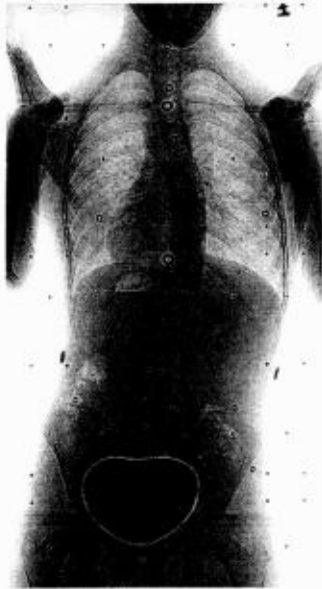
Note:

- A collapsed left costal flare in relation to the right costal flare.
- The more prominent aspect of the pelvis contour on the left.
- Abdominal prominence in relation with an immature posture.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Right Thoracic Type I

Frontal view:



- The right thoracic curve is relatively significant, 36° Cobb angle, with a convex rotation of the apexian vertebrae.
- The cervicothoracic countercurve is slightly pronounced, but there is a specific rotation present.
- There is no lumbar countercurve.
- All the vertebrae underlying the thoracic curve display the same rotation as the thoracic apexian vertebrae.
- Typical deformity of the thorax with a notable frontal counterclockwise tilt, concave ribs horizontalized, convex ribs verticalized.

Sagittal view:



- Typical sagittal aspect: reduced kyphosis and low thoracic lordosis.
- Moderate lordosis.

3D RECONSTRUCTIONS: Right Thoracic Type I

Apical view:



This view is particularly useful in identifying the three-dimensional morphology of the curve.



Frontal view:

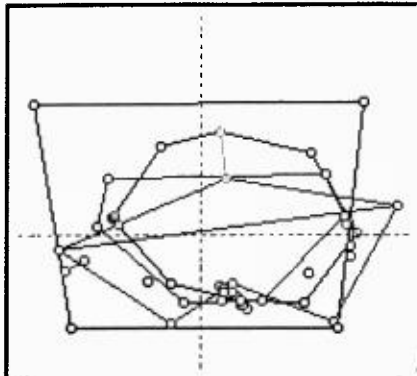
Clarifies the x-ray aspect.

Sagittal view:

Clarifies the x-ray aspect.

3D POSTURES: Right Thoracic Type I

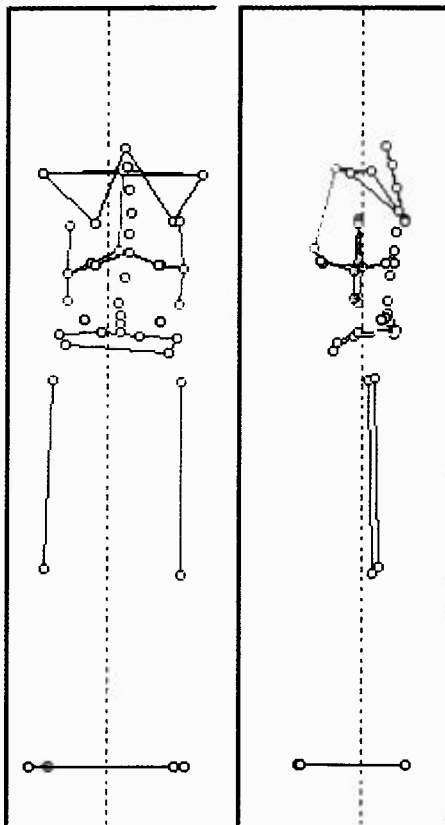
Apical view:



Graphically expresses the clinical postural disturbance in the apical plane.

Note particularly:

- Counterclockwise rotation of the shoulder girdle.
- Right shift of the scapular girdle and thorax.
- Clockwise rotation of the thorax.



Frontal view:

Graphically expresses the clinically visible postural disorganisation of the shoulder girdle and the thorax:

- Tendency for a counterclockwise tilt of the shoulder girdle
- Right lateral shift.
- Little or no pelvic disorientation.

Sagittal view:

Modifications seen in this plane are essentially those in relation with the decrease in kyphosis.

RIGHT THORACIC TYPE II (RT2)

PHOTOS: Right Thoracic Type II

Back view:

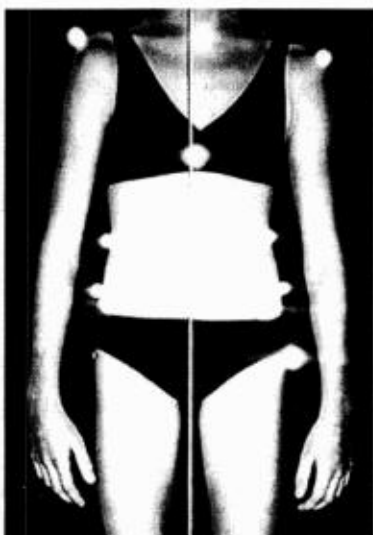
Postural disturbances are predominant at the shoulder girdle level and thorax.



- The dropping and the retropulsion of the left shoulder (more medial and flattened scapula) and the elevation and the antepulsion of the right shoulder (more lateral and detached scapula).
- The shoulder girdle is in a counterclockwise rotation in the horizontal and frontal plane. This disturbance is early and often marked and progressive.
- Here, the tendency for a right lateral shift of the shoulder girdle in relation to the pelvis is artificially corrected by the existence of an early stage left lumbar hemicurve and by a three-dimensional pelvic postural shift in relation to the base of support. When aggravated, the lateral shift occurs to the right.
- The waist angle is often more open on the right side than on the left.
- There is a visible and rather elevated for the amplitude of the Cobb angle right mediothoracic prominence in an upright position. This prominence increases when bending forward.
- The back is flat.
- The rib cage is in a clockwise rotation in the horizontal plane.

Front view:

Disturbances are predominant at the shoulder girdle level and thorax.



- The left shoulder is often lower than the right one: the shoulder girdle is in a counterclockwise tilt in the frontal plane.
- In this case, the tendency for a right lateral shift of the shoulder girdle is artificially corrected (left lumbar hemicurve).
- The waist angle is more open on the right side than on the left.
- There is a frontal "gibbosity" of the right costal flare.
- The left thoracic costal flare appears collapsed in relation to the right one.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Right Thoracic Type II

Frontal view:



- The Cobb angle is 24°.
- The curve is right thoracic with an apex between T7 and T10.
- Very early, a cervicothoracic countercurve can appear which can be relatively progressive, and a lumbar hemicurve can appear which can be little- or non-progressive.
- In this type of scoliosis, there is always, at the lumbar level, a spinal process deviation to the right, a small counterclockwise counter-rotation of the vertebrae, but no counterclockwise inclination of the last lumbar vertebrae.

Sagittal view:



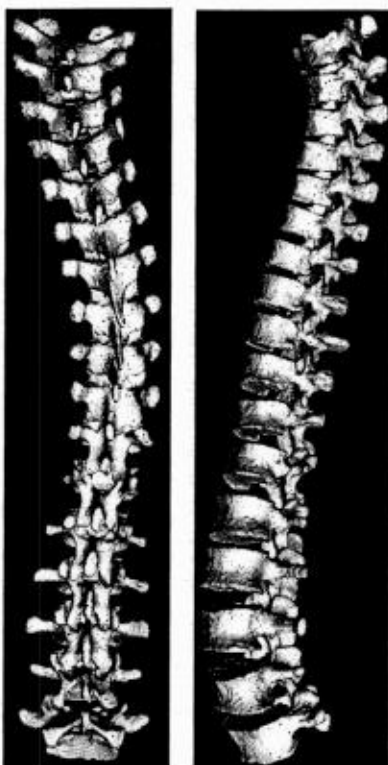
- There is a very clear reduction of the kyphosis in relation to the lordosis, which appears very early in the evolution and which will inevitably deteriorate if the patient is not treated.

3D RECONSTRUCTIONS: Right Thoracic Type II

Apical view:



This view allows to define the three-dimensional aspect of the deformation, non-accessible from the x-rays only.



Frontal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-rays.

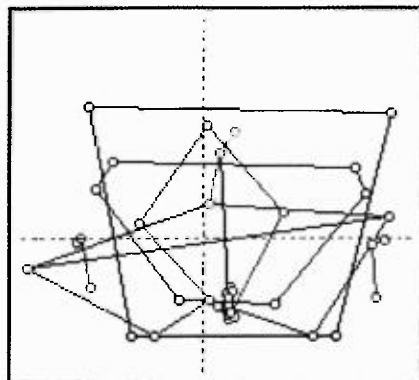
Sagittal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-rays.

3D POSTURES: Right Thoracic Type II

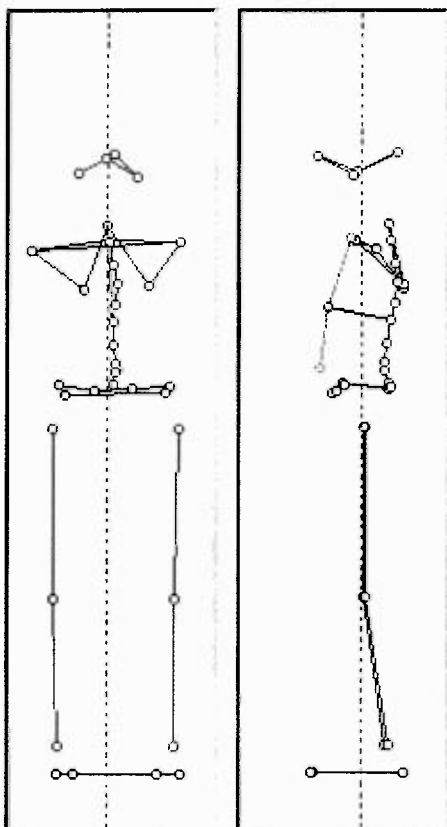
Apical view:

This plane is essential for the initial diagnosis and the evolution of the deformity.



Graphically expresses the clinical problem in the apical plane:

- The counterclockwise rotation of the shoulder girdle is the major anomaly in this type of curve. The correction of this anomaly should be given priority.
- The pelvis does not show a rotation or is in a clockwise rotation.
- Generally, there is no tilt of the pelvis (if there is one, it must not be corrected for itself, for example: with a corrective shoe lift, except in a case of radiologically proven inequality of the inferior limbs).
- The discreet translation towards the left of the shoulder girdle and of the head; if the scoliosis gets worse, this lateral shift will be to the right.
- When the rib cage is represented, it appears in a clockwise rotation.



Frontal view:

Graphically expresses the clinical postural problem in the frontal plane:

- Counterclockwise tilt of the shoulders.
- Apparent left lateral shift in relation to the left translation of the pelvis and the left cervicothoracic countercurve.

Sagittal view:

Graphically expresses the clinical problem in the sagittal plane.

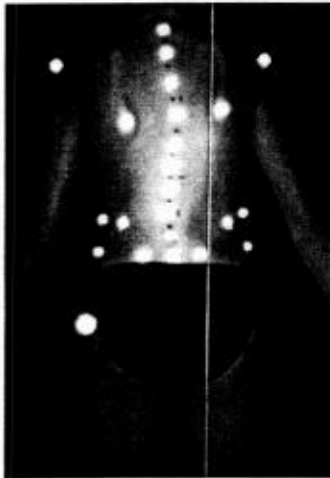
- Little or no anomalies appear in this plane at first, but very quickly, the kyphosis will disappear.

RIGHT THORACIQUE TYPE III (RT3)

PHOTOS: Right Thoracic Type III

Back view:

Postural disturbances are predominant at the shoulder girdle level and thorax.

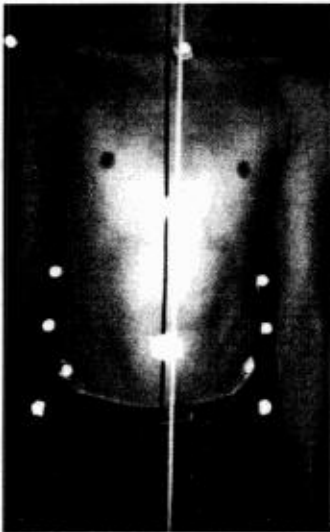


- The dropping and the retropulsion of the left shoulder (more medial and flattened scapula) and the elevation and the antepulsion of the right shoulder (more lateral and detached scapula).
- The shoulder girdle is in a counterclockwise rotation in the horizontal and frontal plane. This disturbance is early and often marked and progressive.
- Here, the tendency for a right lateral shift of the shoulder girdle in relation to the pelvis is artificially corrected by the existence of an early stage left lumbar curve and by a three-dimensional pelvic postural shift in relation to the base of support. When aggravated, the lateral shift occurs to the right.
- There is a visible and rather elevated for the amplitude of the Cobb angle right mediothoracic prominence in an upright position. This prominence increases when bending forward.

- The lumbar prominence is less than the thoracic one and usually remains moderate.
- The back is flat.

Front view:

Disturbances are predominant at the shoulder girdle level and thorax.



- The left shoulder is often lower than the right one: the shoulder girdle is in a counterclockwise tilt in the frontal plane.
- In this case, the tendency for a right lateral shift of the shoulder girdle is artificially corrected (left lumbar curve).

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Right Thoracic Type III

Frontal view:



- The thoracic Cobb angle is 30°. The lumbar Cobb angle is 26°.
- The right thoracic curve has an apex between T7 and T10, the lumbar curve has an apex between L1 and L4.
- Very early, a cervicothoracic countercurve with specific rotation can appear, which can be relatively progressive. The lumbar curve is present very early, it has a low potential to progress.
- In this type of scoliosis, there is always, at the lumbar level, a spinal process deviation to the right, a small counterclockwise counter-rotation of the vertebrae and a counterclockwise inclination of the last lumbar vertebrae.

Sagittal view:



- There is a very clear reduction of the kyphosis in relation to the lordosis, which appears very early in the evolution and which will inevitably deteriorate if the patient is not treated.

3D RECONSTRUCTIONS: Right Thoracic Type III

Apical view:



This view allows to define the three-dimensional aspect of the deformation, non-accessible from the x-rays only.



Frontal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-rays.

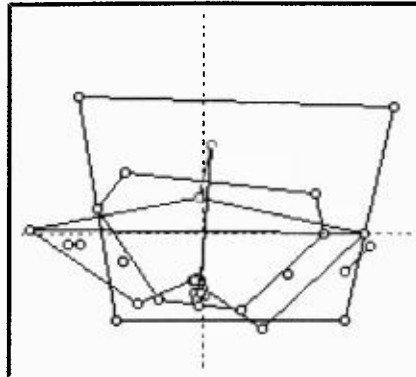
Sagittal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-rays.

3D POSTURES: Right Thoracic Type III

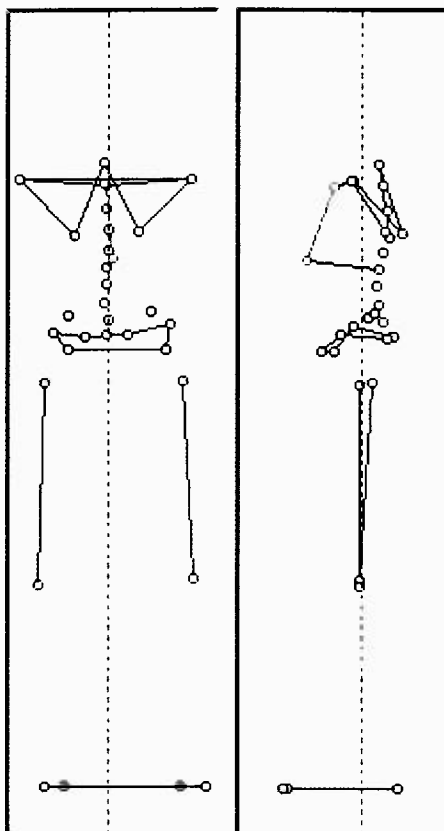
Apical view:

This plane is essential for the initial diagnosis and the evolution of the deformity.



Graphically expresses the clinical problem in the apical plane:

- The shoulder girdle does not show a rotation or is in a counterclockwise rotation. It is desirable to obtain a clockwise rotation.
- The pelvis does not show a rotation or is in a clockwise rotation.
- Generally, there is no tilt of the pelvis (if there is one, it must not be corrected for itself, for example: with a corrective shoe lift, except in a case of radiologically proven inequality of the inferior limbs).
- The discreet translation towards the left of the shoulder girdle and of the head; if the scoliosis gets worse, this lateral shift will be to the right.
- When the rib cage is represented, it does not show a rotation or appears in a clockwise rotation.



Frontal view:

Graphically expresses the clinical postural problem in the frontal plane:

- Counterclockwise tilt or no tilt of the shoulders.
- Apparent left lateral shift in relation to the left translation of the pelvis and the left cervicothoracic and lumbar countercurves.

Sagittal view:

Graphically expresses the clinical problem in the sagittal plane:

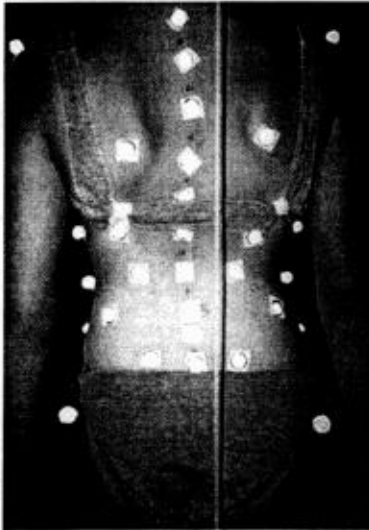
- Little or no anomalies appear in this plane at first, but very quickly, the kyphosis will disappear.

RIGHT THORACIC LEFT LUMBAR TYPE I (RTLL1)

PHOTOS: Right Thoracic Left Lumbar Type I

Back view:

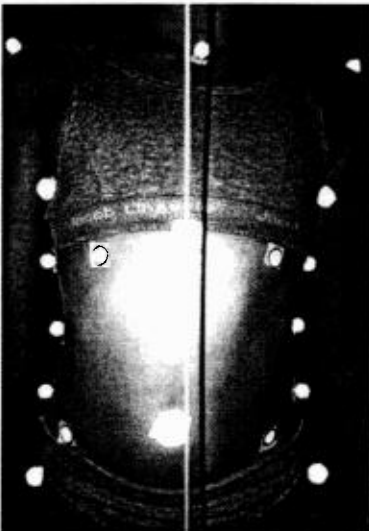
The postural anomalies are a composite of postural anomalies derived from the right thoracic curve and the left lumbar curve.



- Moderate frontal counterclockwise tilt of the shoulder girdle.
- Moderate horizontal counterclockwise rotation of the shoulder girdle.
- Little or no frontal tilt of the thorax, little or no horizontal rotation of the thorax.
- Peu ou pas de bascule frontale du bassin ou de rotation horizontale du bassin.
- Discreet asymmetry of the waist angle.
- None or slight left lateral shift of the trunk.
- Right thoracic and left lumbar prominences are barely visible in a upright position in relation to the measured Cobb angles.

Front view:

The anterior view of this patient indicates essentially an immature postural attitude in this 9-year-old girl with:



- Relative anterior projection of the trunk.
- Abdominal prominence.
- Pelvic anteversion tendency.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Right Thoracic Left Lumbar Type I

Frontal view:

Double major scoliosis of respectively 26° and 28° Cobb angles.



- Both curves are approximately balanced.
- There is a reverse rotation of the apexian vertebrae: right thoracic convex rotation and left lumbar convex rotation.
- Both these curves have a similar potential for progression.
- The two curves which are visible on x-rays clinically correspond to the right thoracic and left lumbar prominences, generally balanced, of average value for the Cobb angle.

Sagittal view:



- In this type of balanced double major curve, the sagittal curves, kyphosis and lordosis correspond to values which are near normal for that age.

3D RECONSTRUCTIONS: Right Thoracic Left Lumbar Type I

Apical view:



This view allows to confirm the three-dimensional aspect of the deformation, non-accessible from traditional x-rays.
Note that the thoracic and lumbar curves are located in different oblique planes.



Frontal view:

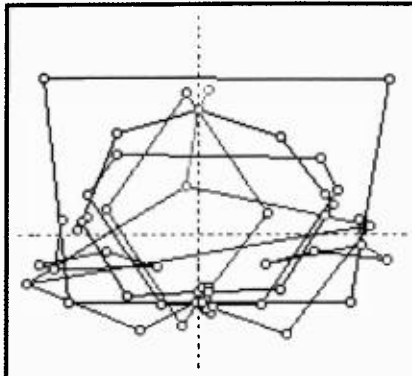
Confirms the deformations of the thoracic and lumbar spine visible on the x-ray.

Sagittal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-ray.

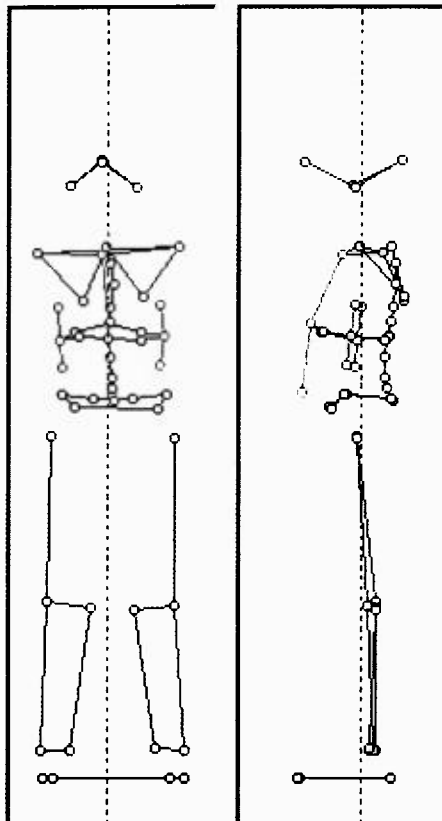
3D POSTURES: Right Thoracic Left Lumbar Type I

Apical view:



Graphically expresses the postural disturbances in the apical plane:

- The counterclockwise rotation of the shoulder girdle in relation with the right thoracic curve.
- The other levels, i.e. thoracic and pelvic, are neither deformed nor disoriented, or if so, very minimally.
- In relation to the base of support, the three levels are either centred or slightly translated to the left.



Frontal view:

The postural view confirms the clinical observations:

- Minimal postural disorganisation in this plane essentially showing a conservation of the frontal balance, no or minimal left lateral shift and a counterclockwise shoulder tilt tendency.

Sagittal view:

Little or no detectable anomalies in this plane.

RIGHT THORACIC LEFT LUMBAR TYPE III (RTLL3)

PHOTOS: Right Thoracic Left Lumbar Type III

Back view:

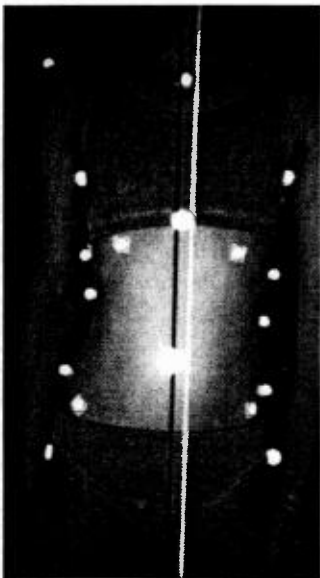
The postural disorganisation due to double curves is always minimal. If the two curves do not aggravate simultaneously, which is frequent, or one of the curves slightly predominates (temporarily or constantly), moderate anomalies appear in relation to the thoracic or lumbar curve. In the right thoracic left lumbar type III scoliosis, the lumbar curve is most often slightly predominant and the pelvis, which is balanced for a long time, tends to become very oblique when the Cobb angle exceeds 30°.



Note for this patient:

- Moderate asymmetry of the waist angle.
- Absence of a shift.
- Absence of a frontal imbalance of the pelvis.
- Sagittal curves slightly pronounced (flat back).

Front view:



Confirms the back view observations.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-Rays: Right Thoracic Left Lumbar Type III

Frontal view:

Major double scoliosis right thoracic left lumbar of 18° and 14° respectively.
(12 $\frac{1}{2}$ -year-old patient, Risser 0).



- Thoracic curve is apparently predominant.
- Rotation of the apexian vertebrae is predominant in the lumbar curve.
- Minimal pelvic obliquity.

Sagittal view:



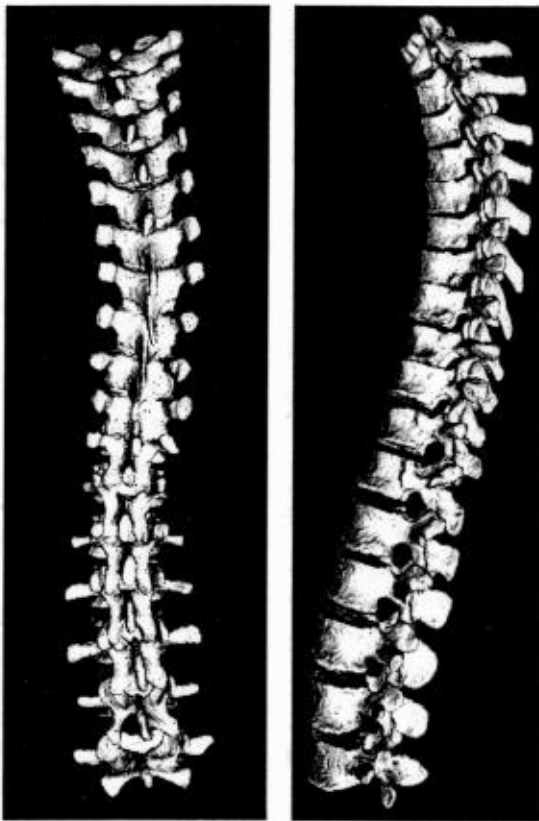
- Kyphosis and lordosis are at the lower limit of the norm, measuring respectively 26° and 32° .
- When the scoliosis aggravates, the kyphosis will diminish more significantly than the lordosis, and can even become 0° or invert.

3D RECONSTRUCTIONS: Right Thoracic Left Lumbar Type III

Apical view:



- Unbalance of the spine in this plane.
- Convex rotation of the apexian vertebrae of the lumbar curve.



Frontal view:

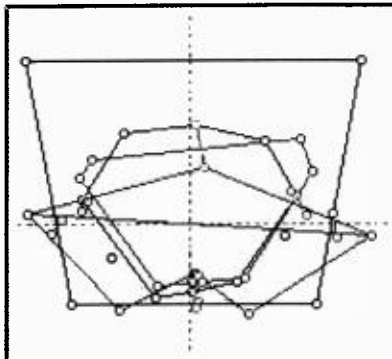
- The thoracic curve is predominant with little or no vertebral rotation.
- The lumbar curve is slightly pronounced, but the vertebral rotation at the apex is significant.

Sagittal view:

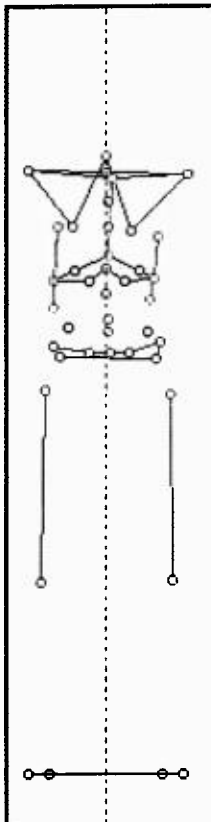
- The sagittal curves are at the lower limit of the norm.

3D POSTURES: Right Thoracic Left Lumbar Type III

Apical view:

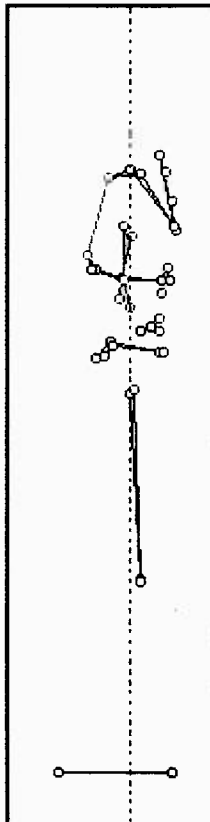


- The trunk and the pelvis remain centred within the polygon of the base of support.
- The pelvis and the thorax are in a counterclockwise rotation in relation to the foot template.
- The shoulders tend to have a clockwise rotation in relation to the foot template.



Frontal view:

Postural aspect at the limit of the norm.



Sagittal view:

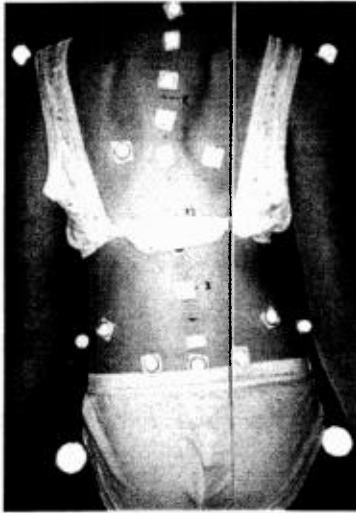
Aspect at the limit of the norm.

LEFT THORACOLUMBAR TYPE I (LTL1)

PHOTOS: Left Thoracolumbar Type I

Back view:

In this case, the postural problem is important and exaggerated in relation to the curve, which is in its early stages (23° Cobb angle).



- The frontal clockwise tilt of the shoulders.
- The frontal clockwise inclination of the thorax and its left translation.
- Generally, the horizontal rotation of the thorax is counterclockwise.
- The left thoracolumbar prominence is visible in an upright position and does not increase or increases slightly when bending forward.
- The frontal pelvic tilt is counterclockwise.
- The waist angle is opened to the left.

Front view:

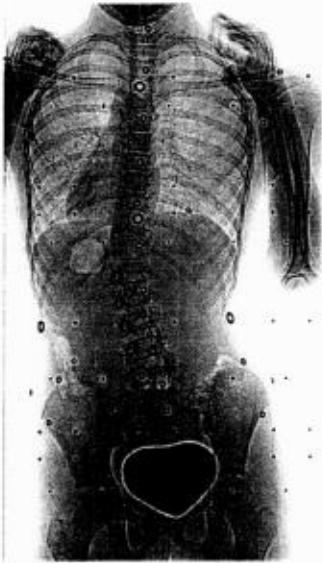


- The postural disorganisation is major in the frontal plane and almost uniquely in this plane.
- The elements noted on the back view are present here as well.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Left Thoracolumbar Type I

Frontal view:



- The apex is between T11 and L1.
- There are no thoracic, lumbar, or lumbosacral countercurves.
- The inclination of the mid thoracic and lower lumbar vertebrae are reversed.
- The pelvis is in a counterclockwise frontal tilt.

Sagittal view:



- Apart from an ante or retropulsion of the thorax, the curves are and should remain slightly or not modified.

3D RECONSTRUCTIONS: Left Thoracolumbar Type I

Apical view:



This view only confirms the frontal clockwise inclination of the thoracic spine.

The apex and the inferior part of the curve are concealed due to a normal lordosis.



Frontal view:

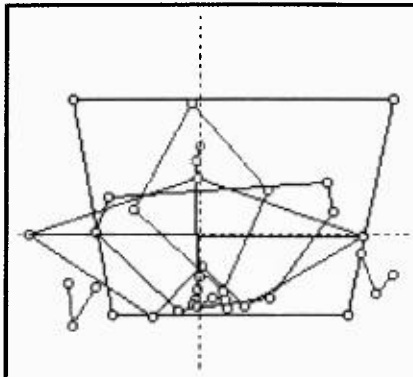
Confirms the deformations of the thoracic and lumbar spine visible on the x-ray.

Sagittal view:

Confirms the deformations of the thoracic and lumbar spine visible on the x-ray.

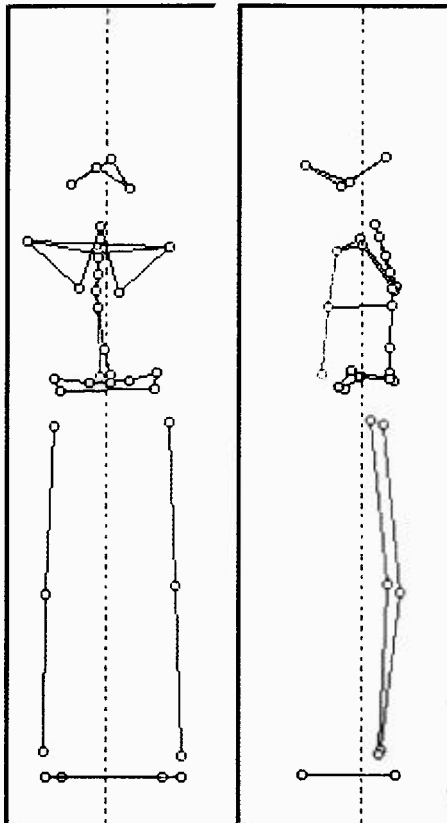
3D POSTURES: Left Thoracolumbar Type I

Apical view:



Graphically expresses the postural disturbances in the apical plane:

- The left translation and the clockwise inclination of the trunk in relation to the pelvis are represented by a shift to the left of the shoulder girdle, which can be in a clockwise or counterclockwise rotation.
- The frontal counterclockwise pelvic tilt usually produces a counterclockwise rotation of the latter in the apical plane.



Frontal view:

Graphically expresses the postural disturbances in the frontal plane:

- The left translation and the clockwise inclination of the trunk in relation to the pelvis.
- There is a pelvic counterclockwise tilt which can be significant and which should be corrected uniquely for itself. This correction is achieved with a shoe lift whose height is selected clinically, with the help of postural measurements. The correction of the pelvic inclination obtained with the shoe lift never enables the correction of the scoliosis, but facilitates it.

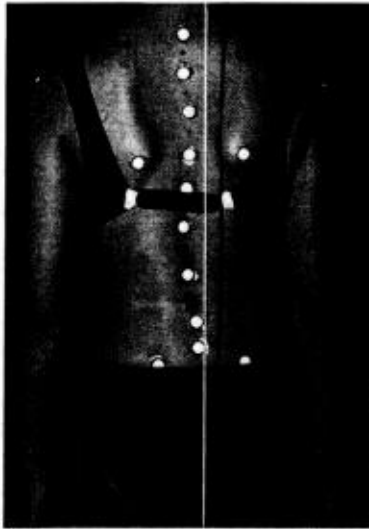
Sagittal view:

- There is generally little or no modification in this plane.
- Please note that this patient presents a bilateral genu recurvatum.

LEFT THORACOLUMBAR TYPE II (LTL2)

PHOTOS: Left Thoracolumbar Type II

Back view:



The clinical observation reveals:

- Upright thoracolumbar or upper lumbar prominence which is perceived better when bending forward.
- Lateral shift of the trunk to the left which usually remains moderate.
- Right thoracic countercurve detectable by palpating the spinal processes.
- Little or no pelvic disorientation at the beginning.
- If the shoulder girdle is disoriented at first, it is preferentially clockwise in the frontal tilt and clockwise in the horizontal rotation.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

Front view:



- In this type of scoliosis, the anterior view shows very few modifications apart from those already indicated in the posterior view.
- Please note that generally, there is no deformity of the costal flares.

X-RAYS: Left Thoracolumbar Type II

Frontal view:



- There is a thoracolumbar curve (22° Cobb angle) with a convex rotation aspect of the apexian vertebrae.
- The apex is between T11 and L1.
- There is a right thoracic countercurve and a right lumbosacral hemicurve. The right thoracic countercurve could be qualified as a compensatory curve because of its small but not negligent potential to progress. The lumbosacral hemicurve is in fact a return to normal of the last lumbar vertebrae up to the sacral vertebrae. Strictly speaking, this hemicurve does not have a potential to progress.

Sagittal view:



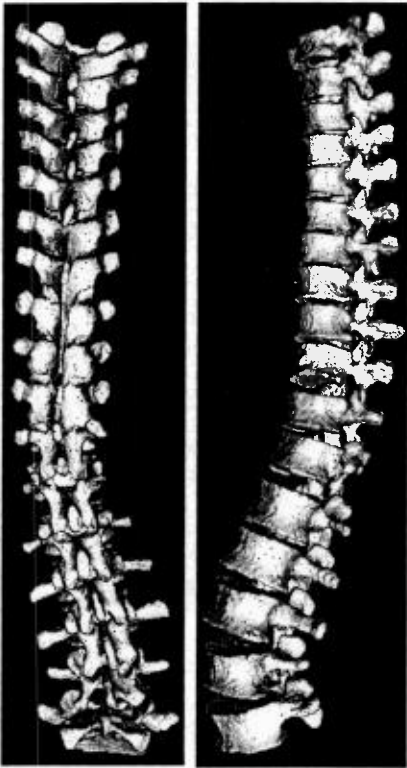
- In this type of curve, a thoracolumbar junctional kyphosis appears early.
- The thoracic kyphosis is generally reduced. In this patient, the kyphosis appears very reduced partly due to the thoracic curve and partly in relation to her age which corresponds to a maturity stage where curves are not very marked in any case.
- The lordosis is generally near normal but rather at the lower limit.

3D RECONSTRUCTIONS: Left Thoracolumbar Type II

Apical view:



This view is particularly useful in identifying the three-dimensional morphology of the thoracic and lumbar spine deformations.



Frontal view:

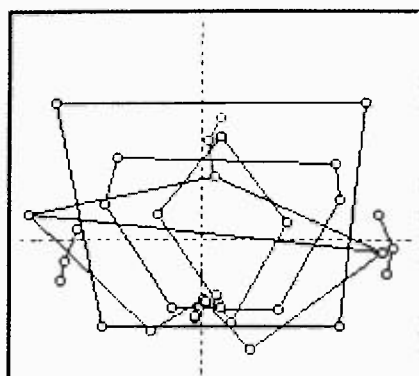
Confirms the thoracic and lumbar spine deformations visible on the x-ray.

Sagittal view:

Confirms the thoracic and lumbar spine deformations visible on the x-ray.

3D POSTURES: Left Thoracolumbar Type II

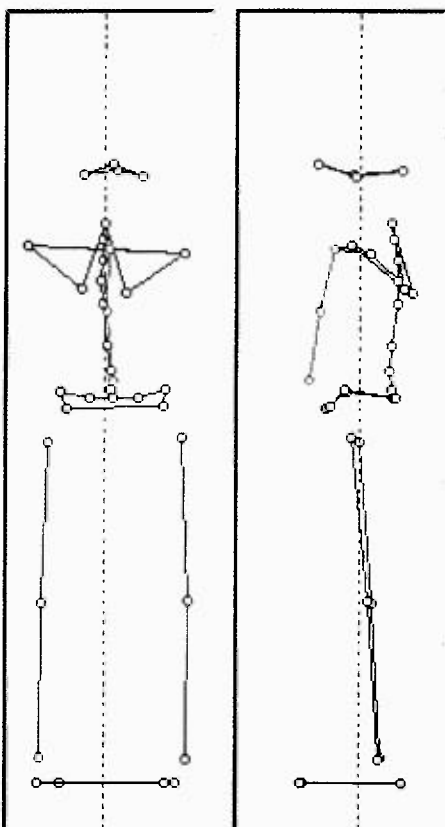
Apical view:



Graphically expresses the postural disturbances in the apical plane:

- There is no evident pelvic disorientation, the pelvis is centred correctly in relation to the base of support.
- Meanwhile, there is a shoulder girdle clockwise rotation and a slight shift to the left.
- If the thorax is measured, it has a tendency for a counterclockwise rotation.
- This aspect of the shoulder girdle and of the thorax in the apical plane is reassuring with regard to the potential for

progression of the thoracic curve. Therefore, there should be no attempt to correct them, and if so, it must be done with care.



Frontal view:

The observed postural disorganisation is linked essentially to the main left thoracolumbar curve.

- The pelvis is slightly or not disoriented.
- There is a left lateral shift tendency of the trunk.
- A clockwise tilt tendency of the shoulder girdle in the frontal plane.

Sagittal view:

In this plane, no modification is actually noticeable in the early stages of the deformity.

LEFT LUMBAR (LL)

PHOTOS: Left Lumbar

Back view:



Cobb angle between 20° and 25°.

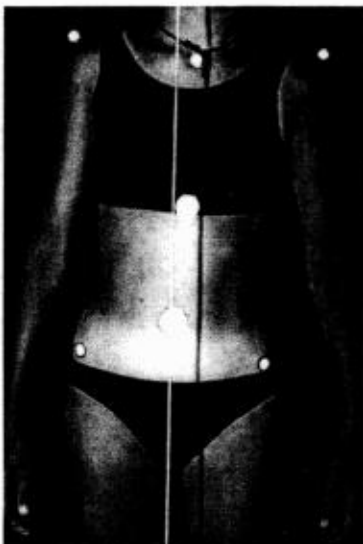
Typically associated postural disorganisation:

- Translation to the left of the trunk in relation to the pelvis.
- Slight lateral inclination to the right of the thorax.

Other possible findings:

- Moderate pelvic obliquity (tilt to the left) that may require the addition of a shoe lift under the left foot.
- Waist angle pronounced on the right.

Front view:



Confirms:

- Translation to the left of the trunk in relation to the pelvis.
- Asymmetry of the waist angle.

N.B.: The plumbline shown on the photo is suspended from the ceiling and falls exactly to the middle of the foot template, midway between the patient's heels.

X-RAYS: Left Lumbar

Frontal view:



- The single left lumbar curve, apex at L2 (between L1 and L4), Cobb angle of 23°.
- Moderate pelvic obliquity:
 - Left tilt.
 - Clockwise rotation, the main reason why the convex "rotation" of the apexian vertebrae does not appear on the x-ray, while the clinical prominence is 7° (measured with the scoliometer).

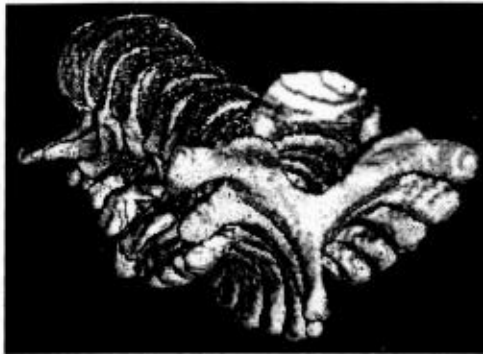
Sagittal view:



- The absence of obvious anomalies in this plane other than the kyphosis and/or lordosis variations normal for the age of the child.

3D RECONSTRUCTIONS: Left Lumbar

Apical view:



- The curve is in an almost frontal plane, in fact slightly oblique from the back to the front and from the right to the left.



Frontal view:

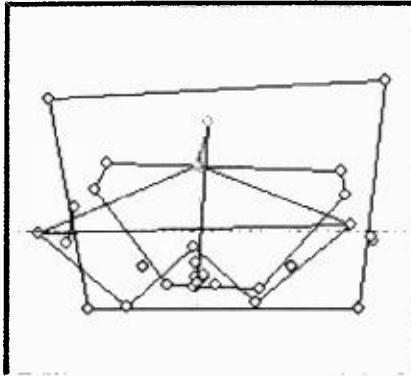
This view accurately reproduces the frontal x-ray.

Sagittal view:

This view accurately reproduces the sagittal x-ray.

3D POSTURES: Left Lumbar

Apical view:

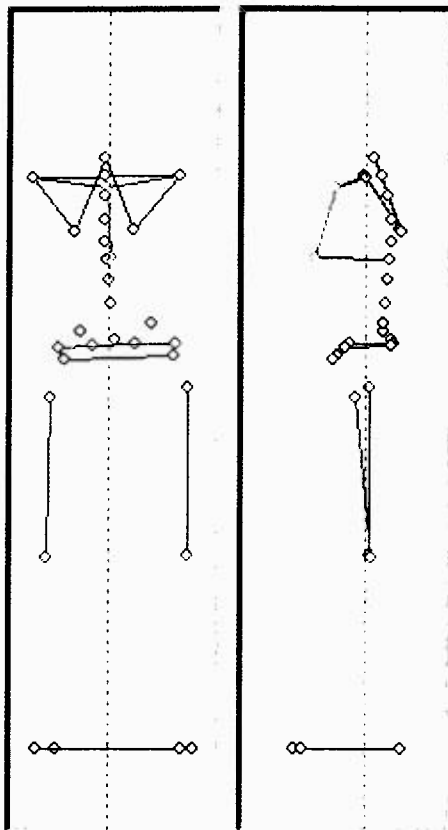


The only obvious element in this plane is:

- The shift to the left of the shoulders in relation to the pelvis, corresponding to the translation of the trunk in relation to the pelvis.

Note also:

- The moderate clockwise rotation of the pelvis in this plane.



Frontal view:

The only obvious element in this plane is:

- The shift to the left of the shoulders in relation to the pelvis, corresponding to the translation of the trunk in relation to the pelvis.

Depending on the severity of the curve, there also may develop a moderate pelvic obliquity that is often hidden initially by the associated clockwise rotation in the horizontal plane.

Sagittal view:

No anomaly is obvious in this plane.