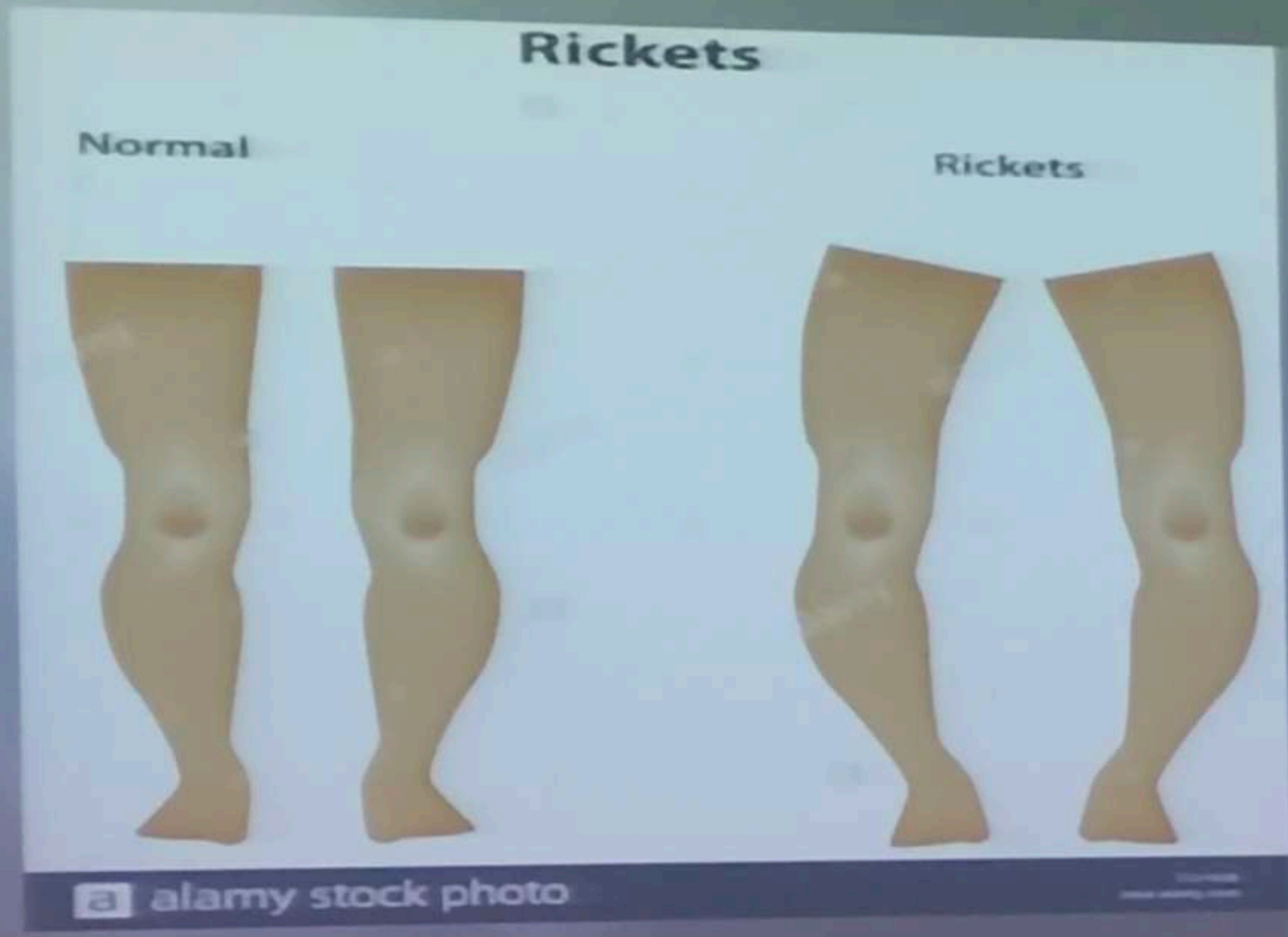
OVERVIEW:

osteomalacia

- softening of the bones, resulting from impaired mineralization, with excess accumulation of OSTEOID, caused by a VITAMIN D deficiency in adults.
- A similar condition in children is called RICKETS.


Rickets
Normal
Rickets
alamy stock photo

PATHOGENESIS:

- insufficient calcium absorption from the intestine because of lack of dietary calcium or a deficiency of, or resistance to, the action of vitamin D
- phosphate deficiency caused by increased renal loss

CAUSES:

- Insufficient nutritional quantities or faulty metabolism of vitamin D or phosphorus
- Renal tubular acidosis
- Malnutrition during pregnancy
- Hypophosphatemia
- Chronic kidney failure
- Tumor-induced osteomalacia (Oncogenic osteomalacia)
- Long-term anticonvulsant therapy
- Celiac disease
- Cadmium poisoning, itai-itai disease

SYMPTOMS:

Bone pain, especially in hips, is also a common symptom. A dull, aching pain can spread from your hips to the following places:

- lower back
- pelvis
- legs
- ribs

pain not respond to analgesic

SIGNS AND SYMPTOMS

- Diffuse joint and bone pain (especially of spine, pelvis, and legs)
- Muscle weakness
- Difficulty walking, often with waddling gait
- Hypocalcemia (positive Chvostek sign)
- Compressed vertebrae and diminished stature
- Pelvic flattening
- Weak, soft bones
- Easy fracturing
- Bending of bones

- **pain** – the bones affected by rickets can be sore and painful, so the child may be reluctant to walk or may tire easily; the child's walk may look different (waddling)
- **skeletal deformities** – thickening of the ankles, wrists and knees, bowed legs, soft skull bones and, rarely, bending of the spine
- **dental problems** – including weak tooth enamel, delay in teeth coming through and increased risk of cavities
- **poor growth and development** –
- **fragile bones** – in severe cases, the bones become weaker and more prone to fractures

DIAGNOSIS:

- Low serum and urinary calcium
- Low serum phosphate, except in cases of renal osteodystrophy
- Elevated serum alkaline phosphatase (due to an increase in compensatory osteoblast activity)
- Elevated parathyroid hormone (due to low calcium

RADIOGRAPHY:

Radiological appearances include:

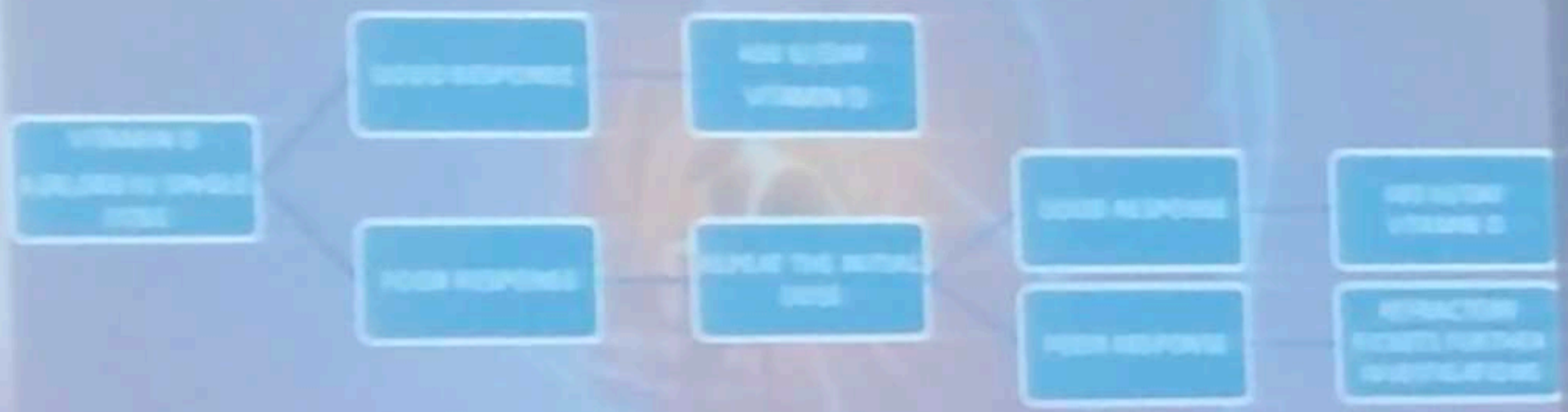
- Pseudofractures, also called Looser's zones.
- Protrusio acetabuli, a hip joint disorder

In protrusio deformity, there is medial displacement of the femoral head.The medial aspect of the femoral cortex is medial to the ilioischial line. The socket is too deep and may protrude into the pelvis

TREATMENT:

- Nutritional osteomalacia responds well to administration of 2,000-10,000 IU of vitamin D3 by mouth daily. Vitamin D3 (cholecalciferol) is typically absorbed more readily than vitamin D2 (ergocalciferol). Osteomalacia due to malabsorption may require treatment by injection or daily oral dosing of significant amounts of vitamin D3.

TREATMENT



- Symptomatic hypocalcemia – 100 mg/kg
- IV calcium gluconate followed by oral calcium or calcitrol -0.05mcg/kg/day

PREVENTION:

- Prevention of osteomalacia rests on having an adequate intake of vitamin D and calcium. Vitamin D3 Supplementation is often needed due to the scarcity of Vitamin D sources in the modern diet

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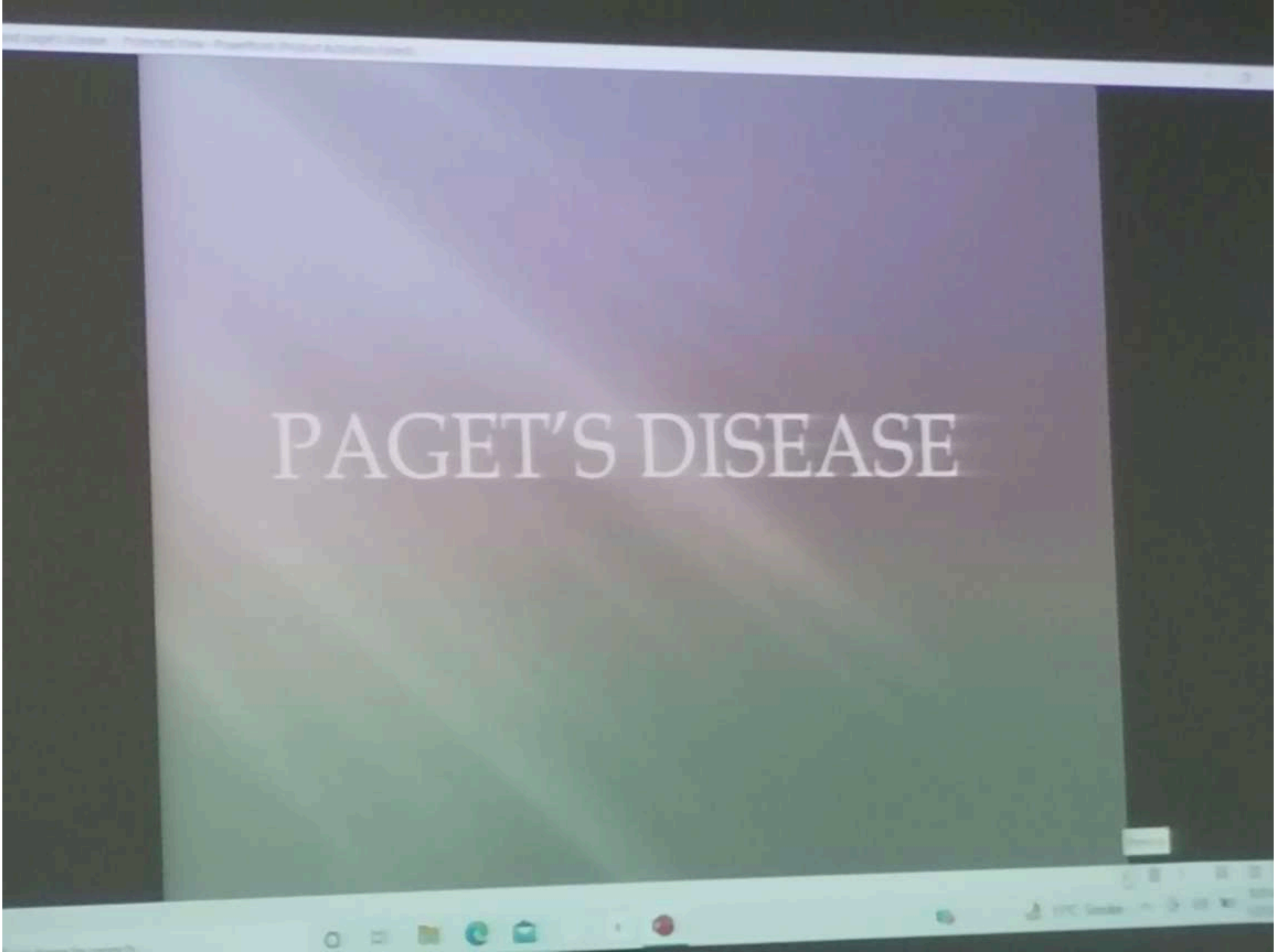
COMPLICATIONS:

- PATHOLOGICAL FRACTURES
- BONE TUMORS


PAGET'S DISEASE

OVERVIEW:

- Paget disease is a localized disorder of bone remodeling that typically begins with excessive bone resorption followed by an increase in bone formation
- This osteoclastic overactivity followed by compensatory osteoblastic activity leads to a structurally disorganized mosaic of bone (woven bone), which is mechanically weaker, larger, less compact, more vascular, and more susceptible to fracture than normal adult lamellar bone.

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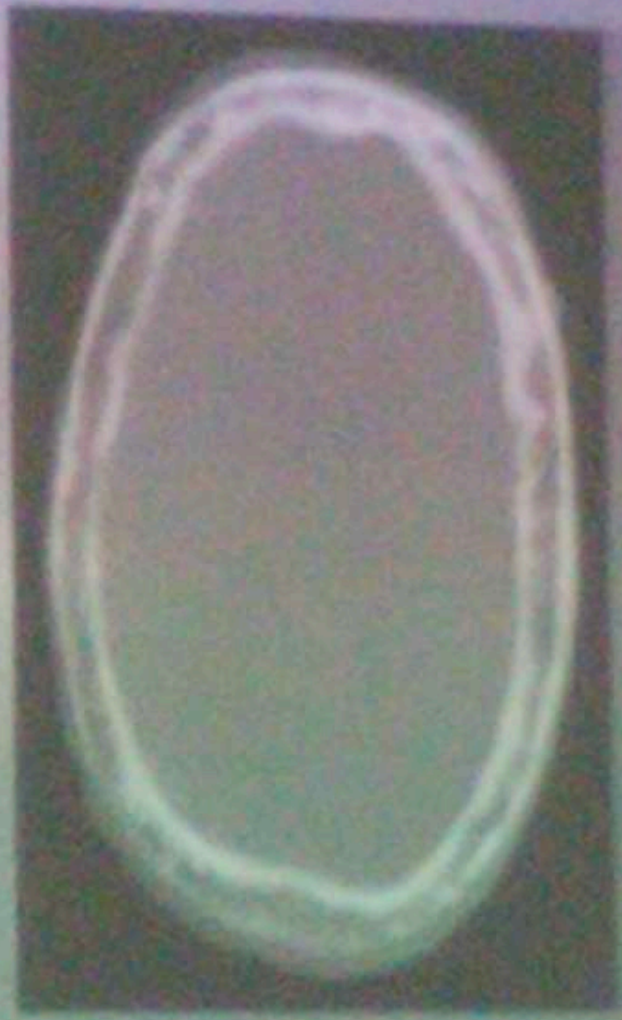
This 92 year-old male patient presented for assessment of sudden inability to move half his body. An incidental finding was marked thickening of the calvarium. There are ill-defined sclerotic and lucent areas throughout. The cortex is thickened and irregular. The findings probably correspond to the "cotton wool spots" seen on plain films in the later stages of Paget's disease.



PATHOPHYSIOLOGY:

- Three phases of Paget disease have been described: lytic, mixed lytic and blastic, and sclerotic.
- At any one time, multiple stages of the disease may be demonstrated in different skeletal regions
- Bone turnover rates increase to as much as 20 times normal.

SYMPTOMS:

- Mild or early cases of Pagets are asymptomatic, and so most people are diagnosed with Paget's disease incidentally during medical evaluation for another problem.
- Overall, the most common symptom is bone pain
- Paget's disease affecting the skull may lead to loss of hearing in one or both ears due to compression of the nerves in the inner ear.
- Rarely, skull involvement may lead to compression of the nerves that supply the eye, leading to vision loss

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COMPLICATIONS:

- Deafness
- Vertigo
- Tinnitus
- Dental malocclusion
- Basilar invagination
- Cranial nerve disorders

- High output cardiac failure due to hypervascularity
- Nerve root compression and cauda equina syndrome

Differential Diagnoses

- Osteoarthritis
- Osteoporosis

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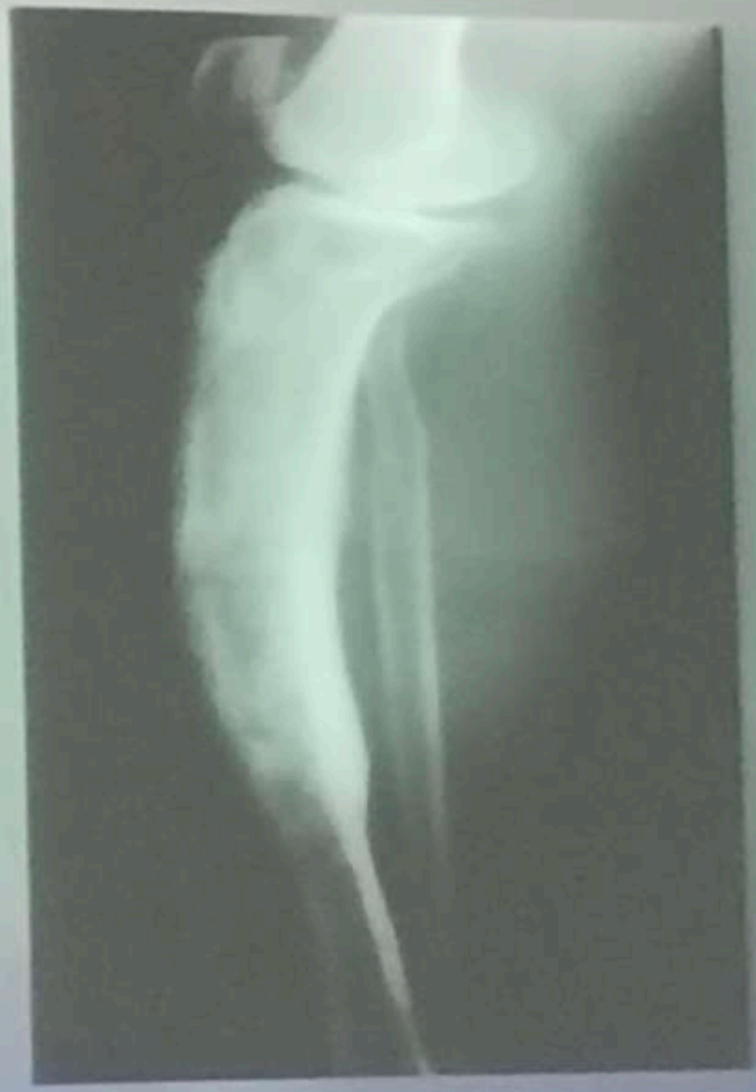
- Osteoarthritis
- Osteoporosis

WORKUP/DIAGNOSIS:

- Pagetic bone has a characteristic appearance on X-rays. A skeletal survey is therefore indicated.
- An elevated level of alkaline phosphatase in the blood in combination with normal calcium, phosphate, and aminotransferase levels in an elderly patient are suggestive of Paget's disease.
- Markers of bone turnover in urine *eg*. Pyridinoline
- Elevated levels of serum and urinary hydroxyproline are also found.
- Bone scans are useful in determining the extent and activity of the condition. If a bone scan suggests Paget's disease, the affected bone(s) should be X-rayed to confirm the diagnosis



STRATEGIES:

Treatment may include:

- physical therapy to improve muscles strength
- Medications called bisphosphonates to inhibit abnormal bone resorption
- medication to manage pain
- surgery to cut, realign, or replace affected bones

BISPHOSPHONATES AND CALCITONIN DRUGS:

- Etidronate
- Pamidronate
- Alendronate
- Tiludronate
- Risedronate
- Zoledronic acid
- Salmon calcitonin