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Opinion Article

The Stress and Strain Pattern in the Ligaments and its Phases

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DESCRIPTION

Joints' ligaments are bands of strong, elastic tissue. They connect bones together, support joints, and control joint movement. Elbows, shoulders, knees, and other joints are all surrounded by ligaments. Joints may become unstable when someone stretches them. Connective tissue with a lot of dense collagen fibres makes up ligaments. They can be found in the body in a variety of sizes and shapes. Some appear to be strings, while others resemble wide or thin bands. Arch-shaped ligaments are also seen. Two bones are frequently joined by ligaments, especially in the joints: They hold the ends of two bones together or stabilize the joint like sturdy, tightly linked straps or ropes. This shows that the bones in the joint won't twist too much or move too far apart and become dislocated.

However, certain ligaments are not connected to any bones. For instance, some ensure that internal organs remain in their proper positions. The womb serves as a common illustration, as it is held in place in the pelvis by ligaments. Additionally, ligaments may join two or more organs together. For instance, ligaments in the abdominal cavity hold the liver, intestine, and stomach in place. These ligaments frequently pass across delicate organs like blood arteries or gland ducts. These structures are safeguarded and kept from bending, twisting, or ripping by the strong connective tissue in the ligaments.

Ligaments heal by a process which includes three phases

- Retraction of the torn ligament ends occurs in haemorrhage with inflammation, as does the formation of a blood clot, which is thereafter resorbed and replaced by a significant cellular infiltration. After the disruption of the ends, a significant hypertrophic vascular response occurs in the space between them, increasing vascularity and blood flow, both of which gradually diminish over time.
- The development of "scar tissue" (dense, cellular, collagenous connective tissue matrix) by hypertrophic fibroblastic cells is referred to as matrix and cellular proliferation. At first, this scar tissue is highly disordered and has more flaws. Even though the types of collagen are aberrant and the collagen fibrils have reduced diameters in the proliferating tissue, after a few weeks of healing, the collagen becomes pretty well aligned with the long axis of the ligament.
- Remodelling and maturation (matrix remodelling) fills in scar flaws, however despite the matrix eventually resembling a ligament, significant variations in composition, architecture, and function still exist. Modified proteoglycan and collagen types, immature collagen crosslinks, short collagen fibril widths, changed cell connections, increased vascularity, aberrant innervation, enhanced cellularity, and the partial resolution of matrix "flaws" are some of the differences that continue to exist.

CONCLUSION

Ligaments are not connected to any bones. For instance, some ensure that internal organs remain in their proper positions. The womb serves as a common illustration, as it is held in place in the pelvis by ligaments. This ensures that the bones in the joint don't twist too much or move too far apart and become dislocated. Ligaments contribute to the body's stability whether they attach bones or organs to one another.

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