

## Paracrystalline and crystalline inclusions of the human testis in cases of subfertility

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Testicular crystalline inclusions, namely Charcot-Böttcher and Spangaro crystals of Sertoli cells, Lubarsch crystals of spermatogonia and Reinke crystals of Leydig cells, have been considered normal ultrastructural features of the post-pubertal human testis (Reinke, 1896; Chemes et al., 1977; Kaya et al., 1985). Nevertheless, their significance is not known. We have noted that these structures are dynamic and may disappear and reappear in some cases of subfertility. In particular, patients showing spermatogenesis arrest or germ cell aplasia usually do not show any crystalline inclusions. We study herein using transmission electron microscopy testicular biopsies of young infertile men (idiopathic infertility or varicocele) showing intracytoplasmic crystalline and/or paracrystalline inclusions. Sertoli cells' paracrystalline inclusions consist of closely packed electron-dense longitudinal fibrils, sometimes including a granular and light core. Coarse ca. 5-25  $\mu\text{m}$  long and 2-3  $\mu\text{m}$  thick bundles composed of 5 or 10 nm thick filaments mainly locate in the basal cytoplasm near the nucleus. Reinke's crystals, in turn, appear as variable-sized (2-5  $\mu\text{m}$  long) polyhedral crystals with a honeycomb lattice and sharp edges consisting of 5-10 nm filaments filling wide areas of the cytoplasm. Alternatively, they may appear as filamentous/tubular, electron dense (0,5  $\mu\text{m}$  long) units. In both cases they associate to mitochondria and dilated smooth endoplasmic reticulum. Due to their structure, whether these inclusions arise or not within the nucleus and are somehow transported to the cytoplasm is not yet clear. Although their exact molecular composition remains to be discovered, they are not likely to be associated to steroidogenesis but rather they may represent a kind of protein deposit.

### References

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### Keywords

Human testis, electron microscopy, infertility, Leydig cells, Sertoli cells, crystalline inclusions.