

## Histology of the Ligamentum Teres of the Hip: A Basic Science Study

**Bryan Wang, MBBS, MRCS (Edin), SINGAPORE**  
Kong Bing Tan, MBBS, MRCPATH, FRCPA, SINGAPORE  
James Loh, MBBS, FRCS (Edin), FRCS (Ortho), SINGAPORE

Changi General Hospital  
Singapore, SINGAPORE

### Summary:

A basic science study describing the histopathological features of the ligamentum teres of the hip in fresh human specimens.

### Abstract:

#### Background and Aim:

There have been several studies done on the ligamentum teres of the hip, yet little has been elucidated as to its true function, with many considering it to be a predominantly vestigial structure in adult hips. However, recent studies have shown possible mechanical and biological roles in the function of the hip joint, and the increasing use of hip arthroscopy has shown that injury to the ligamentum teres does have a contributory role in patients with chronic hip pain. This study is in essence a basic science study looking at the microstructure of the ligamentum teres, with special emphasis on the presence and distribution of nerve bundles. Our study aims to correlate the microstructure of the ligamentum teres with its postulated functions, allowing greater understanding of its role and guiding treatment principles in pathologies involving the ligamentum teres.

#### Methods:

Fresh specimens were excised intraoperatively in 12 patients undergoing hip procedures. They were then preserved in formalin solution and subsequently sent to the laboratory for histological analysis by our collaborating pathologist. The specimens were sectioned and stained, and subsequently examined under the microscope to look at their microstructure. In addition, special staining techniques were employed to look for nerve tissue within the ligamentum teres specimens.

#### Results:

The ligamentum teres of the hip is composed predominantly of a connective tissue matrix of collagen fibres, fibrous and adipose tissue, with an overlying layer of investing synovium. In addition, there are blood vessels of varying sizes surrounded by a layer of encircling fat. All specimens examined showed the presence of nerve bundles of varying shapes and sizes, confirming our hypothesis that the ligamentum teres of the hip does contain neural elements which may serve different functions and purposes within the hip joint. There were also some specimens which showed presence of metaplastic change, possibly as a result of ongoing adaptive processes.

#### Conclusion:

This is the first known study describing the overall microstructure of the ligamentum teres (and its neural elements) with the use of fresh human specimens. Based on our findings, the ligamentum teres should no longer be considered a developmental vestige, as there is evidence to show that it has both mechanical and biological functions within the hip joint. Surgical procedures involving the hip joint should aim to minimize trauma or damage to the ligamentum teres, so as to limit any potential loss of function within the joint.