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• 計畫中文名稱	膝變形及膝損傷之立體影像重組與臨床運用(II)
• 計畫英文名稱	Three Dimentional Image and Clinical Application for Injury and Deformity of the Knee
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• 中文關鍵字	膝關節傷害；膝變形；立體影像重構；半月軟骨；十字韌帶；骨切開術
• 英文關鍵字	Knee injury；Knee deformity；Three dimensional image reconstruction；Meniscus；Cruciate ligament；Osteotomy
• 中文摘要	解剖學上，膝之半月軟骨或十字韌帶之立體結構於臨床上具特殊重要性，且運動傷害、意外傷、老年人退化性皆有可能造成上述之損傷，一旦受傷不僅臨床上極疼痛之苦，甚或活動受限、不穩定性等。受傷之平面 X-ray 及電腦斷層檢查及磁共振檢查，只能看出平面或斷面影像之損傷；甚或關節鏡也只能看到膝關節腔內之部份結構，且具侵犯性，若能得到三度空間之半月軟骨或十字韌帶，則於治療上，或治療計畫模擬，具實際之臨床莫大助益。質言之：(1)術前診斷出損傷部位之立體三度空間。(2)術前之人工韌帶甚或人工半月軟骨(Collegen template regeneration of meniscus)之再生模型板之製作半月軟骨或韌帶或其代替品。(3)模擬骨骼肌肉系統之骨骼矯正截骨手術，如脛骨高位切骨術(High tibia corrective osteotomy)或骨切骨術應用於髖部(Coxa varus or coxa valgus)或肘部(Cubitus varus,或 Cubitus valgus)等。本研究是以現有之電腦斷層或磁共振之二度空間影像，直接連線於電腦影像畫面，重組出立體三度空間之立體影像。以求得實際臨床之模擬立體影像及臨床運用。
• 英文摘要	Three dimentional image and Clinical application for meniscus tear, ligament rupture and deformity of the knee. For diagnosing soft tissue injury of the knee (meniscus and ligament), MRI and arthroscope are the two most often employed methods. Both of them have a relatively accurate diagnostic rate. Because MRI is a planar image, what we can get is either ruptured or intact structure. Obviously, the answer that an MRI can offer is only "yes" or "no". Execpt for open arthrotomy, we can hardly identify the extent and shape of the tear. Although arthroscopes have some advantages over MRI, but they are invasive techniques. On account of the above reasons, we tried to use three dimentional computerized clinical images (CT or MRI) to create a stereo architecture of the knee joint.

So we can identify the extent and shape of the meniscus or ligament tear, and thus a higher successful rate of surgery can be expected. With the same theory and procedure, we can assess the pre-operation, post-operation condition and operation simulation, such as "corrective osteotomy" for deformity of the knee (Genres varus, Genrus valgus), the hip (Coxa varus, Coxa valgus) and the elbow (Cubitas varus, Cubitus valgus)...etc. Similarly, we hope that this technique can also be applied to the knee prosthesis replacement, to facilitate modeling of the shape and size of the prosthesis, preoperatively.