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Experiments with a Novel Content-Based Image Retrieval Software: Can We Eliminate Classification Systems in Adolescent Idiopathic Scoliosis?

Study Design Preliminary evaluation of new tool.

Objective To ascertain whether the newly developed content-based image retrieval (CBIR) software can be used successfully to retrieve images of similar cases of adolescent idiopathic scoliosis (AIS) from a database to help plan treatment without adhering to a classification scheme.

Methods Sixty-two operated cases of AIS were entered into the newly developed CBIR database. Five new cases of different curve patterns were used as query images. The images were fed into the CBIR database that retrieved similar images from the existing cases. These were analyzed by a senior surgeon for conformity to the query image.

Results Within the limits of variability set for the query system, all the resultant images conformed to the query image. One case had no similar match in the series. The other four retrieved several images that were matching with the query. No matching case was left out in the series. The postoperative images were then analyzed to check for surgical strategies. Broad guidelines for treatment could be derived from the results. More precise query settings, inclusion of bending films, and a larger database will enhance accurate retrieval and better decision making.

Conclusion The CBIR system is an effective tool for accurate documentation and retrieval of scoliosis images. Broad guidelines for surgical strategies can be made from the postoperative images of the existing cases without adhering to any classification scheme.

使用一種全新以內容為基礎的圖像檢索軟件的實驗：我們可以淘汰青少年突發性脊柱側彎的分類系統嗎？

研究設計 新工具的初步評估

目的 要確定這個新開發以內容為基礎的圖像檢索（CBIR）軟件是否可以成功地用於從數據庫中檢索青少年突發性脊柱側彎（AIS）的類似個案的圖像以幫助計劃治療而不是依分類系統。

方法 62 個曾以手術治療的 AIS 病例輸入新開發的 CBIR 數據庫。5 個不同的側彎模式的新病例被用來作為查詢圖像。這些照片被輸入 CBIR 數據庫以從現有的病例中檢索相似的圖像。這些都由資深外科醫生進行分析是否符合查詢的圖像。

結果 在該查詢系統變異性集的限制下，所有得到的圖像均符合該查詢圖像。其中一個病例在數據庫中沒有類似匹配的圖像。其他四個都在查詢系統中檢索到匹配的數個圖像。沒有匹配的病例都被排除在數據庫內。術後的圖像之後進行分析，以檢查手術策略。源自結果可能有廣泛的治療方針。更精確的查詢設置，包括彎曲的影像，和一個更大的數據庫將提高檢索的準確度和更好的決策。

結論 CBIR 系統是一個有效的工具能將脊柱側彎影像準確地存檔和檢索。並能從手術後的圖像得到廣泛的手術策略方針而不依任何分類系統。