

杜祥瑞,李倩文,王艳,贾秀琴,王一帅,王臣,李坤成.利用CT能谱成像定量分析钙含量:体模研究[J].中国医学影像技术,2013,29(10):1720~1722

## 利用CT能谱成像定量分析钙含量:体模研究

### Quantitative analysis of calcium content with CT spectral imaging: A phantom study

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英文关键词: [Tomography](#), [X-ray computed](#), [Spectral imaging](#), [Quantitative analysis](#)

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中文摘要:

目的 探讨利用CT能谱成像的能谱曲线方程定量分析钙含量的可行性.方法 将不同浓度的氯化钙溶液分装在不同试管内,利用GE Discovery CT750 HD CT对其进行能谱成像扫描,之用ROI分析得到能谱曲线,并通过能谱曲线解析得出关于keV和CT值(HU)的方程,分析方程中常数与浓度之间的关系.结果 分析不同浓度氯化钙溶液的能谱曲线,均得出形式为 $Y=a \times \exp(b \times X)+c \times \exp(d \times X)$ 的方程,其中Y代表CT值,X代表keV.对不同浓度溶液的曲线方程进行统计分析,发现系数b和d与氯化钙浓度不相关,其数值保持基本恒定,常数a和c与氯化钙浓度呈正相关.结论 能谱曲线方程可以分别得出与钙本身特性相关及与浓度相关的常量,有助于识别物质中的钙成分并测定其含量.

英文摘要:

**Objective** To investigate the feasibility of quantitative analysis of calcium content using equation of spectral curve of CT spectral imaging. **Methods** Solutions of calcium chloride of different concentrations were filled in multiple tubes. GE Discovery CT750 HD CT scanner was used for spectral imaging of these solutions. After spectral scan, ROI analysis was used to obtain generate spec curve of different solutions. All curves were solved to form equation from keV to CT values. Then the relationship between the constants of equations and the concentrations were analyzed. **Results** Analysis of the spectral curves from the solutions of calcium chloride resulted in the equations as:  $Y=a \times \exp(b \times X)+c \times \exp(d \times X)$ , Y represented CT value, X represented keV. Further analysis reveal that b and d remained almost constant and showed no correlation with iodine concentration. Constant a and c had linear correlation with concentration. **Conclusion** Analysis of spectral curve equatio reveals the constants that representing the nature of calcium and the concentration, respectively, which will be helpful to the identification and quantification of calcium content.

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