

Estimasi Usia Dan Tinggi Badan Serta Penentuan Jenis Kelamin Dan Suku Berdasarkan Gambaran Ct-Scan Tulang Dada = Estimation of Age and Stature and Determination of Sex and Ethnicity from Sternal Measurements using Multidetector CT-scan

Denys Putra Alim, author

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Abstrak

Latar Belakang: Pembuktian identitas jenazah harus secara ilmiah guna memenuhi tanggung jawab profesi dan keadilan hak asasi manusia karena diatur oleh UU Indonesia. Ada potensi tinggi dari tulang sternum untuk menjadi acuan baru identifikasi forensik.

Tujuan: Mengetahui peranan tulang dada dari gambaran CT-scan populasi dewasa untuk proses identifikasi forensik di Indonesia.

Metode: Penelitian potong lintang ini dilakukan terhadap 95 laki-laki dan 110 perempuan populasi Indonesia yang berusia antara 20-70 tahun dan menjalani pemeriksaan CT scan dada di Departemen Radiologi RSCM secara konsekutif. Data klinis mencakup usia, jenis kelamin, tinggi badan, dan suku sedangkan data radiologis mencakup skor osifikasi sternum dan iga, morfometrik sternum, dan variasi anatomis xiphoid. Analisis data menggunakan IBM SPSS versi 20.0 dengan uji t tidak berpasangan, korelasi Pearson, dan regresi linear maupun logistik serta kurva AUROC untuk memprediksi luaran penelitian. Semua nilai $p < 0,05$ dianggap bermakna.

Hasil: Skor total osifikasi tulang dada berkorelasi kuat dengan usia ($r_s = 0,541$) dengan persamaan prediksi usia secara umum = $20,417 + 4,927 \cdot \text{LOS}$ (osifikasi iga ujung sternal kiri) + $2,667 \cdot \text{LOF}$ (osifikasi iga pertama kiri) + $2,098 \cdot \text{FX}$ (fusi xiphisternal) ($aR^2 = 41,9\%$, SEE 9,95 tahun). Seluruh parameter morfometrik sternum berhubungan dengan jenis kelamin ($p < 0,05$). Gabungan parameter panjang korpus, lebar sternebra 1, dan indeks sternum memiliki nilai prediksi jenis kelamin sebesar 87,3%. Terdapat korelasi panjang tulang dada dengan tinggi badan ($r = 0,712$) dengan persamaan tinggi badan = $97,422 + 0,466 \cdot \text{CL}$ (panjang sternum) ($aR^2 = 50,5\%$, SEE 5,84 cm). Tidak terdapat hubungan antara morfometrik sternum dengan daerah asal suku. Variasi anatomis sternum yang paling langka adalah ujung xiphoid trifid, terdapat suprasternal bones dan iga bifid.

Kesimpulan: Sternum dapat dijadikan acuan untuk identifikasi forensik untuk penentuan usia, jenis kelamin, dan tinggi badan.

.....Background: The process of personal identification must be conducted scientifically in order to fulfill the professional responsibility and human rights justice as regulated by the Indonesian Law. There is a high potential for the sternal bone to become a new reference in forensic identification.

Aim: To know the role of sternal bone from CT-scan images of adult population for the forensic identification process in Indonesia.

Method: This cross-sectional study was carried out on 95 males and 110 females of Indonesian population aged between 20-70 years who undergo a chest CT-scan in the Radiology Department of Cipto Mangunkusumo National Hospital, Jakarta consecutively. Clinical data include age, sex, stature, and tribes while radiological data include sternal and rib ossification scores, sternal morphometrics, and xiphoid anatomical variations. Data were analysed using IBM SPSS version 20.0 with unpaired t-test, Pearson or

Spearman correlation test, linear or logistic regression and AUROC to estimate age and height and also determine sex. All p values < 0.05 were considered statistically significant.

Result: Total ossification score was positively correlated with age ($r_s = 0.541$) with the regression formula for age estimation is $20.417 + 4.927 \cdot \text{LOS}$ (ribs ossification at left sternal end) + $2.667 \cdot \text{LOF}$ (left first rib ossification) + $2.098 \cdot \text{FX}$ (fusion of xiphisternal) which yielded aR^2 of 41.9% and SEE 9.95 years. All sternal morphometrics parameters were related to sex determination ($p < 0.05$). The combination of parameters sternal body length, sternebrae 1 width, and sternal index has a correct gender prediction rate of 87.3%. There is a positive correlation between sternal length and height ($r = 0.712$) with the regression formula for stature estimation is $97.422 + 0.466 \cdot \text{CL}$ (combined sternal length) which yielded aR^2 of 50.5% and SEE 5.84 cm. There is no relationship between sternal morphometrics and the origin of tribes. The rarest sternal anatomical variations are trifid xiphoid ends, suprasternal bones, and bifid ribs.

Conclusion: The sternal bone can be used as a reference for forensic identification in estimating the age and height and also determining sex.