Koronarografija kompjutoriziranom tomografijom – tehnike snimanja i doze zračenja: rezultati Poliklinike SUNCE Split

Coronary computed tomography angiography – acquisition techniques and radiation doses: results in SUNCE Polyclinic Split

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UVOD: Uvođenjem 64-slojne kompjutorizirane tomografije (MSCT), metoda koronarografije kompjutoriziranom tomografijom (MSCT koronarografija) postala je korisna dijagnostička pretraga za isključenje koronarne bolesti srca (KBS). Ova metoda se smatra adekvatna za selektirane indikacije: A) kod pacijenata s niskom i srednjom vjerojatnošću za KBS; B) za brzu evaluaciju pacijenata s bolovima u prsištu; C) za analizu koronarnih prenosnica; D) za analizu stentova.

SVRHA: Prikazati prednosti i mane različitih tehnika snimanja MSCT koronarografije, tehnike snižavanja doze zračenja i usporediti vlastite rezultate s literaturom.

PACIJENTI I METODE: U vremenskom periodu od lipnja 2011. do listopada 2014. snimljeno je 215 pacijenata sa sumnjom na KBS. MSCT koronarografija je učinjena na 64 slojnom MSCT aparatu s dvije tehnike snimanja. Pacijenti sa frekvencijom srca >65/min su snimljeni helikalnom tehnikom snimanja, a oni s frekvencijom <65/min step-and-shoot tehnikom. Dodatni parametar za odabir tehnike snimanja je specifični klinički upit ili indikacija. Svaki pacijent s frekvencijom >65/min dobio je beta-blokator dva sata prije snimanja.

REZULTATI: Učinjeno je 215 MSCT koronarografija i to: 186 step-and-shoot (prospective gating) i 29 helikalnom tehnikom snimanja (retrospective gating). Srednja vrijednost doze zračenja tehnikom step-and-shot iznosila je 2,5 mSv (0,47 mSv-6,44 mSv), a helikalnom 4,8 mSv (2,1 mSv-7,92 mSv).

ZAKLJUČAK: Poznavanje i primjena različitih tehnika snimanja MSCT koronarografije pomaže nam da postignemo maksimalnu dilataciju koronarnih arterija i nisku srčanu frekvenciju (<65/min), da iskoristimo sve prednosti duge diastole kako bi dobili što bolji slikovni materijal uz najmanju moguću dozu zračenja. Step-and-shoot tehnika snimanja je adekvatna za pacijente s frekvencijom srca <65/min, pacijente mlađe i srednje životne dobi i evaluaciju stentova. Helikalna tehnika snimanja je adekvatna za pacijente s frekvencijom >65/min, pacijente starije dobi, CT ventrikulografiju i za analizu koronarnog bridginga.

INTRODUCTION: With 64 slice CT scanners, coronary computed tomography angiography (CCTA) has emerged as a useful diagnostic imaging modality for the assessment of coronary artery disease. It is considered appropriate for selected indications: A) patients with a low-to-intermediate pretest probability for obstructive coronary artery disease (CAD); B) rapid evaluation of patients with chest pain in emergency; C) by-pass analysis; D) stent analysis.

AIM: The aim is to present advantages of different CCTA techniques, dose reduction methods and to compare our results with the current literature.

MATERIALS AND METHODS: During June 2011 and October 2014 we studied 215 consecutive patients with suspected CAD. CCTA was performed in all patient using a 64 slice CT scanner with two different (prospective and retrospective gating) scanning protocols. Patients with heart rate (HR) >65 bpm were assigned for helical scanning (retrospective gating) and patients with stable HR <65 bpm for step & shoot scanning (prospective gating). Next inclusive parameter was specific clinical question or indication. Each patient with HR>65 bpm received beta-blockers two hours before the scan.

RESULTS: 215 CCTA were scanned: 186 step & shoot (prospective gating) and 29 helical (retrospective gating). The median value of radiation dose for step & shoot technique was 2,5 mSv (0,47 mSv-6,44 mSv) and for helical: 4,8 mSv (2,1 mSv-7,92 mSv).

CONCLUSION: Applying different CCTA acquisition techniques helps to achieve maximal coronary dilatation and a low heart rate (<65 bpm). All benefits of the long diastolic phase are crucial to achieve the best possible image quality at the lowest patient radiation dose. Step & shoot acquisition technique is appropriate for patients with HR <65 bpm, younger, middle age patients and stent evaluation. Helical acquisition technique should be used in patients with HR >65bpm, elderly patients, if CT ventriculography is needed and analysis of coronary bridging (systolic and diastolic phase).

LITERATURE

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