

## **CURRENT CARDIAC APPLICATIONS OF EBCT & USAGE OF STATINS**

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- 1) Electron Beam CT has continuously evolved since its invention in the 1980's.
- 2) Currently, it offers many exciting means to visualize the heart which can be done with the following advantages over existing techniques:
  - Ease of operation (especially being non-invasive);
  - Quick;
  - Cost-effective;
  - Accurate (Electron Beam Coronary Angiography is the only modality approved by the F.D.A. of the US GOVERNMENT as an effective alternative to conventional catheter-based Coronary Angiography).
- 3) Coronary Calcium scoring can detect Coronary Artery Disease accurately and early enough to enable non-surgical treatment to be started.
- 4) Be prepared to go beyond just ordering a Calcium score if you suspect the patient has complex Coronary Artery Disease that needs further evaluation (see Conclusions below).
- 5) By doing an E.B. Coronary Angiogram you will be able to assess the exact intraluminal narrowing of areas of plaque deposition noted on E.B.T. Calcium scoring, which may be very important if the lesion is proximally-located (implying possible deprivation of blood flow to the WHOLE vessel distal to a proximal lesion), AND also because plain E.B.T. cannot pick up any SOFT plaque which has not yet calcified.
- 6) By ALSO doing an E.B. Myocardial Perfusion, you can evaluate the amount of blood effectively reaching the myocardium bordering stenotic coronary segments. If the perfusion is still adequate, it means Collateral Blood supply is able to keep the at-risk myocardium alive, enabling you to pursue aggressive Statin therapy to stabilize and regress the plaque(s) without immediately needing to un-block the lesion(s) surgically.
- 7) Statins have now been well proven to work extremely effectively on remodelling coronary plaques. They can actually cause plaques to regress to the point of disappearance, if given the chance to work at these plaques at the high enough dosage. Thus you should be prepared to prescribe the statin at the high dosage recommended

for plaque-regression. A small dose is only helpful to lower raised serum lipid levels, but cannot complete the task of removing the vast load of cholesterol already deposited in a patient's coronary artery walls when severe disease is present.

- 8) Do not be deterred by the possible elevation of liver enzymes during statin therapy. This may occur when the liver realises it has to manufacture more enzymes to perform the enormous task of metabolizing a large cholesterol load carried to this organ by statins returning from contact with coronary plaques. By reducing statin dose appropriately over a period of time, liver enzymes WILL diminish, enabling you to determine which statin dose is best tolerated by your patient. The only hitch is that you will need to keep the patient on statins for a longer time frame to regress all the plaques, now that you have had to reduce the dose. The only time when liver enzymes don't diminish on cutting statin dosage is if your patient originally had a liver problem even before starting statins, but you would have avoided this problem if you had adequately prepared your patient by a base-line liver function test PRIOR to considering statin commencement.

- 9) Here are some closing remarks for your reference:

The following algorithm may be useful in dealing with patients who present with Clinical Features and /or Risk Factors of Coronary Artery Disease:

- A) Perform a plain E.B. T. Coronary Calcium study in place of the traditional Treadmill Electrocardiogram which only has a Sensitivity of 60% (compared to over 90% for E.B.T.);
- B) If the test yields a negative result, the patient can be reassured because E.B.T. also has a high Negative Predictive Value of 95+ %, such that the chances are almost zero for any major cardiac event to occur in a negatively-scored individual in the next 3 years;
- C) If the test proves positive, then the referral physician should be the person to decide on the next step.
- i) He may choose to order a catheter-based Coronary Angiogram which is reasonable;
  - ii) However there are at least 3 categories of patients who may be too ILL to undergo an invasive procedure, or unable to AFFORD the cost for such, or simply do not wish to have anything INVASIVE done on them.

These cases may be considered for alternative E.B.T. studies including Electron Beam Coronary Angiography as well as Myocardial Perfusion and /or Wall Motion assessment which are all non-invasive,

quick and less expensive than similar but invasive /radioactive procedures.

- iii) A decision to go beyond a plain E.B.T. Calcium study may have to be made bearing in mind that a small Calcium Score value does not guarantee against significant disease, because it is really the LOCATION /DENSITY of the plaque(s) that matters---plaques sited proximally in major vessels and denser plaques offer serious threats even if their actual Calcium Score numbers are relatively low. Furthermore plain E.B.T. scanning cannot pick up as yet non-calcified SOFT plaques which would need delineation by contrast agents (such as by an Electron Beam Coronary Angiogram which only requires peripheral intra-VENOUS rather than catheter-based intra-ARTERIAL injection). In addition, an Electron Beam Myocardial Perfusion or else Wall Motion study will further evaluate the FUNCTIONAL status of the heart muscle in the affected area(s) , by shedding light on the adequacy of Collateral blood vessels in the vicinity of diseased coronary segments, enabling one to decide if life-threatening surgical relief is urgently needed.