
Abstract Forssellföreläsning

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History of CT Procedures: Past, Present and Future

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Image guided procedures have changed diagnostic and therapeutic paradigms. Most inflammatory and cancerous diagnoses are diagnosed and many treated percutaneously in lieu of surgery. Historical review of CT provides perspective and insights on innovations, omissions, and overlooked concepts which have influenced modern procedures and suggest future directions.

CT procedures have advanced as a result of improved equipment, computers, instruments, clinical techniques, and pathologic advancements. The first procedure was performed on a "two minute scan time" CT device compared to sub-second devices used today. Two historical innovations conceived to improve CT procedures, the longitudinal scan (Topogram, etc) and radiation dose reduction, have developed into important separate techniques.

Aspiration and cutting needles should be used appropriately. Aspiration needles are very safe and provide excellent cytologic samples. Cutting needles provide large tissue samples suitable for anatomic pathology, biomarker immunohistochemistry, flow cytometry, and gene analysis. A skillful interventionalist balances the need for maximizing tissue samples and safety of different instruments.

Image guided treatments now include fluid drainages, chemical injections, and thermal ablations. CT is well suited because it consistently displays instruments, tissue changes and complications. Large probes, air, and contrast can be easily seen.

New techniques can lessen the possibility of bleeding. Contrast dynamic scans can visualize vessels to be avoided. Using a guidance cannula, local hemostasis can be achieved by insertion of angiographic coil with thrombin. With coagulopathic patients, bleeding risk can be minimized by pre-injecting blood products in the pathway (fresh frozen plasma for increased INR or platelets for low platelet count).

The evolutionary refinement of procedures is well illustrated by considering CT guided celiac nerve blocks. The first blocks were performed with two needles and large volumes of neurolytic fluid. Now they are effective and safe using a single needle thermal ablation.