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Description

In this 1982 story, NBC Medical correspondent Frank Fields explains and demonstrates Nuclear Magnetic Resonance, which can capture images inside the body without use of X-rays or injected isotopes.

Keywords

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Citation

MLA
Transcript

Nuclear Magnetic Resonance – Early MRI – Can Scan for Tumors

BRYANT GUMBEL, anchor:
Some doctors say the new medical scanner just may become a physician’s diagnostic dream. Here to tell us about it is WNBC’s health and science editor Dr. Frank Field. Good Morning Frank.

DR. FRANK FIELD (WNBC-TV), reporting:
Good Morning Bryant.

GUMBEL: What’s this about?

DR. FIELD: Well the system is called NMR, that stands for Nuclear Magnetic Resonance and it’s totally different from any other medical diagnostic tool you’ve ever seen. Now as you know with X-rays, radiation is passed right through your body and that leaves shadows on a photographic plate outside your body. Now with a gamma scanner radioactive isotopes are injected into your body and then the images are formed by a computer. But with NMR, you get a picture, a cross section of the body, and you can also get the chemistry of the cells of the body and it’s safe. Now I recently went to the Fonar Corporation in Melville, New York where Dr. Raymond Damadian put me through the NMR scanner.

RAYMOND DAMADIAN, M.D. (Fonar Corporation): Frank if you come on over here and step up on the platform we’ll get you set for a scan. Do you have any metal objects on you?

DR. FIELD: Well I got a wristwatch.

DR. DAMADIAN: Give me that, because we don’t want to magnetize it.

DR. FIELD: Okay. It resembles a familiar CT or CAT scanner, but the similarity stops there. This Fonar scanner uses no X-rays, it requires no injections of any kind, and it utilizes only a large, powerful but harmless magnet, and a radio signal far weaker than that produced by a CB radio.

DR. DAMADIAN: Lie back and make yourself comfortable. We’re going to be advancing you into the magnet to do a scan across your chest, remember there are no X-rays, no radiations, ionizing radiations of any kind, we took your jacket off just so we wouldn’t crease it.
DR. FIELD: The medical use of NMR was developed in the early seventies by Dr. Damadian, and here is the basic principal. The body is made up of billions of atoms, each one behaves like a tiny magnet. When put into a larger magnet, like the one in the Fonar scanner, the magnetism of the cells interact with the magnetism of the large magnet. The product of this interaction is a radio signal. It turns out that normal cells have a different radio signal from cancer cells. Pictures which reveal body chemistry can be made from these radio signals. In 1976, Dr. Damadian produced the first pictures of a tumor in a mouse, and later that year this monkey was the largest animal that would fit into a new machine. And the first successful scan of a human was made in 1977. Today a scan of any part of the body can comfortably made in matter of minutes.

DR. DAMADIAN: Frank as you can see this is the image of your chest, and there’s the heart in the center, there’s the backbone, and you’ll notice inside the heart these blue lakes, that, those are the, that’s the ventricles of your blood where the, of your heart where the blood is concentrated. This is the left side of your chest, your heart as you remember leans a little bit towards the left, this is the left lung field. There’s the right. Now in your case of course we know there’s nothing wrong.

DR. FIELD: If there were any tumors here you would see that as a picture.

DR. DAMADIAN: Exactly.

DR. FIELD: How could you analyze if it was a real tumor or not?

DR. DAMADIAN: Well take for example, take for example this region over here, that might give us cause to worry except in your case we know you’re normal. And see the spot right here in the right lung field?

DR. FIELD: Yea. Right.

DR. DAMADIAN: Well the slice was made low enough down in your chest so that it goes across the liver.

DR. FIELD: Right.

DR. DAMADIAN: And it just, yes that’s right, and just getting a piece of the top of your liver.

DR. FIELD: Okay Dr. Damadian, now you find that my cross section was perfectly normal, can you give us an example of let’s say of breast cancer, how a woman, if you looked at a lump you would be able to detect it was cancer or not.

DR. DAMADIAN: See this blue territory here that’s, attached to the chest wall? That’s the tumor, it’s pushed.

DR. FIELD: You think it’s a tumor.

DR. DAMADIAN: We think it’s a tumor, yea.

DR. FIELD: Okay so now.

DR. DAMADIAN: Because of its appearance, see it’s pushing the breast tissue up.

DR. FIELD: Can you bring that cursor in and do an analysis of that breast? Okay now the pointer, the cross is on top of the bump, what does that tell you?

DR. DAMADIAN: The cross is on the mass and it’s now focused the scanner right on that spot.

DR. FIELD: While the woman’s on the table.
DR. DAMADIAN: While the woman’s on the table.
DR. FIELD: You’re looking at that spot and you’re going to tell me if it’s a cancer or not.
DR. DAMADIAN: Exactly, we’re doing a non-surgical biopsy.
DR. FIELD: Let’s see the numbers.
DR. DAMADIAN: You see here, now this is the analysis of the lady with breast cancer that you saw.
DR. FIELD: Her number is 301.
DR. DAMADIAN: Yes. And that’s cancer.
DR. FIELD: 301 is cancer.
DR. DAMADIAN: That’s cancer.
DR. FIELD: If you had a patient who had a cancer and was being treated, chemotherapy or whatever kind of treatment, would you be able to tell if that cancer is disappearing as the numbers get higher?
DR. DAMADIAN: Yea that’s the wonderful thing about it because now you have numbers for the first time in medical history, and you’re locked in to the chemistry of that tissue as you’re treating, and as the treatment proceeds and as the tissue begins to respond, you’ve got your chemical signals to look at as proof that it’s responding.
GUMBEL: Frank, is it just cancerous cells the machine can detect or any abnormalities in the body, I mean aneurisms, brain swellings, disc problems?
DR. FIELD: The future is really unlimited because what you can do with this without X-rays, without any kind of injection of material, you not only can get cross sections of any part of the body as many times as you want to because you’re not invading the body, you’re not using X-rays, you can do it everyday, you can take mammograms three times a day with this system. You not only get the cross section and see what’s there, but when you move that little cursor around the area, you can do a bio-chemical analysis of that area, you can also, its a biopsy.
GUMBEL: It’s a biopsy without entering the body.
DR. FIELD: Exactly. And the strange part of it is that NMR, Nuclear Magnetic Resonance has been around for, oh, many years, the two discoverers got a Nobel award, and now it’s finally being used for medicine.
GUMBEL: You said earlier that it was safe, totally safe, is there no negative effect from continually throwing the,
DR. FIELD: Throwing you into a magnet.
GUMBEL: the imbalance, yea.
DR. FIELD: At this point the magnetic field is so low that there appears to be no problem at all.
GUMBEL: Dr. Frank Field, thank you.
DR. FIELD: Thank you, pleasure being here.