INTERNET NEWS

BS. Nguyễn Văn Công

. NEWS | MRI

stem cell injections treat knee osteoarthritis

on
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ows that injections of mesenchymal stem cells can improve clinical sympto
with knee osteoarthritis and may result in early cartilage regeneration, ac
n delivered November 30 at RSNA in Chicago.

led by first author Hossein Ghanaati, MD, of Tehran University of Medical
presented a study demonstrating that the approach significantly reduced p
, with MRIs suggesting regeneration of the affected knee cartilage.

e can confidently state is that the progression of the disease has complet
and there are no MRI findings indicating disease progression," Ghanaati s

thritis is among the most common destructive joint diseases, with an estim
and 18% of women suffering from the disease globally. Few effective treat
e other than medical therapy for pain control, Ghanaati noted.

hymal stem cells are multipotent stem cells found in bone marrow and are
labs around the world to make and repair skeletal tissues, such as cartila
fat found in bone marrow. In this study, the group hypothesized that injec
o knee joints could serve as an intervention to treat patients.

iminary trial, the group treated 30 patients (27 women and three men, me
s old) with moderate to severe knee osteoarthritis. In each patient, clinicia
a solution of stem cells (70 million allogeneic cells) into the genicular arte
that supplies blood to structures around the knee.

e patients were admitted for one day following the procedure. MRIs of pat
were acquired prior to the procedure and at one, six, and nine months afte
ffness, and physical function were assessed using WOMAC (Western Ont
Master Universities Osteoarthritis Index) patient questionnaire scores.

ng to the findings, the technical success rate of the procedure was 100%.
C scores for patients over 55 years old (n = 16) dropped from 32.63 prior t
ation to 7.69 nine months later; WOMAC scores dropped for patients unde
ld (n = 14) from 25.14 to 3.36.

t symptoms improved significantly," Ghanaati said.

ion, the MRIs revealed small mean increases in the cartilage of the knee -
e, an increase of 0.84 millimeters to 0.96 millimeters on axial views of the
ng to the results.

RIs indicated some cartilage regeneration. However, it remains unclear wh
resents true regeneration, edema, or even inflammation due to cartilage
ration," Ghanaati said.

urther research is needed to explore whether intragenicular artery injection
chymal stem cells can regenerate cartilage, the study clearly indicates the
ch significantly reduces pain in patients after nine months, he said.

ocedure can be regarded as a substantial advancement in pain managem
s with knee osteoarthritis," Ghanaati concluded.

EWS | CT

us CT tracks fatty tissue changes in people at risk
ng cancer

n Yee

deep learning to CT imaging to assess changes in subcutaneous adipose
ver time could help predict outcomes among individuals vulnerable to lung
g to research presented at the recent RSNA meeting.

ing could improve risk assessment among those at high risk of the disease
rly heavy smokers, said presenter Fabian Pallasch, MD, of University Med
Freiburg in Germany.

earning allows for opportunistic screening of subcutaneous adipose tissue
screening chest CTs," he said.

suggest that body composition can help predict cancer and cardiovascula
outcomes, the investigators noted. Most of these studies have focused on
in the muscle; less is understood about the role assessment of subcutane
tissue (SAT) could play in a screening setting.

up developed a deep learning model for automatic 3D quantification of adi
n low-dose chest CT and assessed any associations between this tissue a
among a population of heavy smokers at high risk of lung cancer who
ted in screening.

in the study were 26,144 patients who participated in the National Lung C
ng Trial (NLST) at baseline and at one-year follow-up (total scans, 52,228)
nts were between the ages of 55 and 70 and had at least 30 smoking pac
The team tracked SAT volume and density as measures of the SAT quali
tient. The primary outcome of the research was all-cause mortality, with ad
es of mortality due to lung cancer or cardiovascular disease.

aseline characteristics of the study population included the following:

Baseline characteristics of 26,144 patients at risk of lung cancer

Body mass index (over 25 considered overweight; 30 considered obese)	28.79
Adipose tissue volume, mL (mean)	4788.5
Adipose tissue density, Hounsfield units (mean)	-90.5
All-cause death	7%
Atherosclerotic cardiovascular disease death	1.8%
Lung cancer death	1.6%

line, only SAT density was associated with all-cause mortality (after
g for risk factors such as age, sex, race, smoking status, pack years
ce of hypertension and/or diabetes, and past stroke or heart attack),
ratio of 1.07 (with 1 as reference) and a p-value of 0.003).

oup also found that those patients who experienced "fat wastin
e in SAT volume or density -- of 10% or more over the period o
oorer survival outcomes compared to those with stable SAT vol
y (SAT volume hazard ratio, 1.94 [p <0.001]; SAT density haza
<0.001]). The investigators also noted that "similar association
for lung cancer and cardiovascular mortality."

density] at baseline and a decrease in SAT volume or [SAT den
one year are independently associated with mortality in lung ca
ning-eligible heavy smokers beyond clinical risk factors, which m
rove personalized risk assessment and prevention," they repor

udy findings highlight the promise of AI for predicting lung canc
nes among those at high risk, according to Pallasch and collea

menting a tool like the proposed deep learning model into the
onic medical record could help for opportunistic screening of alt
taneous adipose tissue," he concluded. "Extracting this unused
ation may be helpful to identify high-risk individual and reduce
lity and mortality."

NEWS | WOMENS IMAGING | BREAST

redicts malignancy on breast ultrasound

legretto
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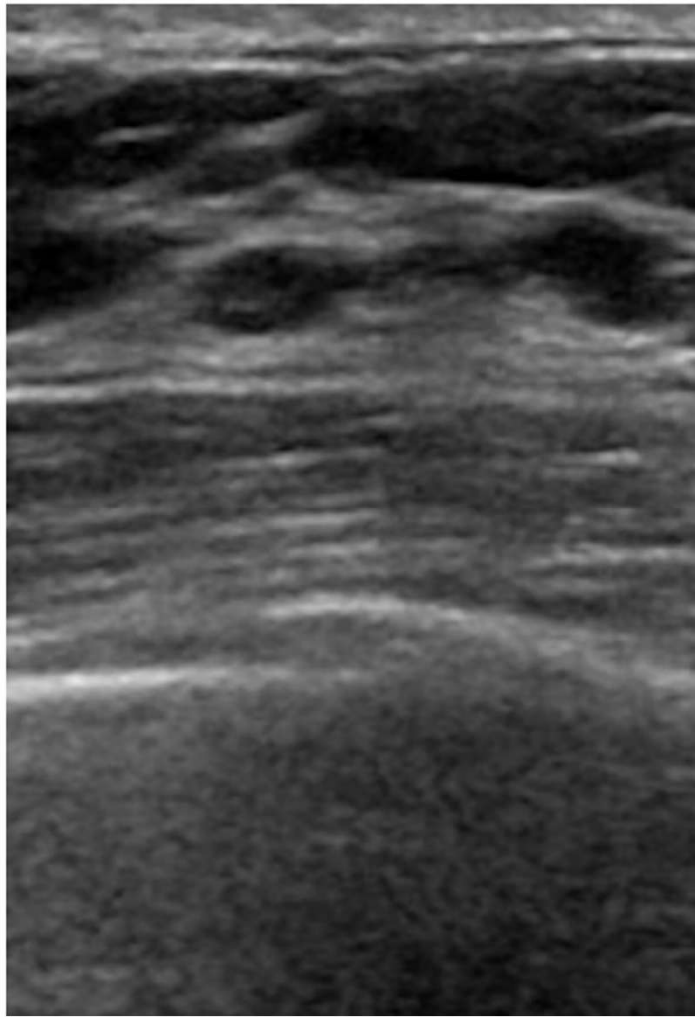
accurately predict malignancy on breast ultrasound based on BI-
ent, according to research published December 11 in *Academic*

lgun Guldogan, MD, from Acibadem Altunizade Hospital in
found that an AI method showed comparable performance to that
nd can help avoid unnecessary biopsies and follow-up exams.
AI-assigned BI-RADS 2 as safe, we could potentially avoid 11% of
opsies and 46.2% of follow-ups," the Guldogan team wrote.
have demonstrated how AI can be applied to breast ultrasound.
ave shown how AI aids in image interpretation, reduce false-
and potentially help decrease the workload of radiologists.
olleagues evaluated the performance of a commercially available
s DS Study Tool, version 2.3.0, Koios Medical) for BI-RADS
ment in breast masses detected on breast ultrasound. The
uded data from 715 breast masses detected in 530 women. Of the
luded, 134 were malignant while 581 were benign.



center study, the researchers included three breast imaging centers from the same institut
radiologists. One radiologist performed an ultrasound exam, obtaining two orthogonal view
ion. From there, a second radiologist retrospectively reviewed the images, being blinded to
ical data.
hers found moderate agreement between the AI model and the radiologists when it came t
g benign and probably benign from suspicious lesions.

Comparison of performance between AI, radiologists for predicting malignancy on breast ultrasound based on BI-RADS assessment

re	Radiologist 1	Radiologist 2	AI
vity	98.51%	80.72%	97.76%
city	75.56%	98.51%	65.40%
e predictive value	54.10%	47.99%	39.64%
ve predictive	99.58%	99.32%	99.48%
cy	84.06%	79.72%	71.61%

el confirmed that no lesions categorized as BI-RADS 2 were malignant, while two lesions c
3 were confirmed to be malignant. The team reported that by considering BI-RADS 2 lesio
by AI as safe, radiologists could potentially avoid 18 out of 163 of benign lesion biopsies a
v-ups.
e, the algorithm hypothetically downgraded 29.4% (142/483) of the BI-RADS 3, 4, and 5 les
3. It also upgraded 122 out of 470 benign or possibly benign lesions as suspicious, with a l

uthors suggested that based on these results, AI's implementation into clinical workflows c
o sustainability in healthcare practices.
ists are provided with complete clinical data, the value of AI will be much greater when use
with the physician's evaluation," they wrote.

EWS | DIGITAL X-RAY

scans support high-velocity resistance training
r adults

ergy x-ray absorptiometry (DEXA) scans show that high-velocity resistance trainin
s bone mineral density in older adults, according to a study published December

ature review of studies that included 1,203 people, DEXA scans revealed significa
elocity resistance training on bone mineral density (BMD) at the lumbar spine, tot
oral neck, according to a group led by Dawn Skelton, PhD, of Glasgow Caledonia
y in Scotland.

dies included in this review suggest that incorporating high-velocity resistance trai
regimens contributes to the prevention of osteoporosis in older adults," the group

ocity resistance training (HVRT) is typically performed with lighter loads (medicine
for instance) at fast (≤ 1 second) concentric speeds. This refers to the rate at whi
hortens or contracts during lifting.

rican College of Sports Medicine recommends resistance training two to three tim
d weight-bearing endurance activities three to five times per week to preserve bon
dulthood, yet the most effective intervention is still up for debate, according to the

r, there is growing evidence that suggests that HVRT has superior benefits on BM
d to traditional resistance training in older adults, they added.

ate evidence of this potential, the group searched five major electronic databases
studies that explored the effects of HVRT on BMD in older adults (mean age ≥ 50
y found 2,696 potentially relevant studies and eventually narrows the list to 25 tha
w's inclusion criteria. Studies were published between 2003 and 2021.

25 studies, 12 were original HVRT intervention studies and 13 were follow-up stu
tions in the original studies ranged in length from six months to 50 months, with
ies ranging from two to three times per week. In the follow-up studies, the durat
p occurred between six months and 16 years.

XA was used to measure BMD at the lumbar spine, total hip, femoral neck, whole
lius, femoral shaft, total proximal femur, and the proximal femur.

g to the analysis, HVRT had a statistically significant effect on BMD in older adults
pine, total hip, and femoral neck, with improvements in BMD ranging from 0.9 %

on, BMD measurements significantly decreased after the interventions in the foll
where the interventions had ceased and the dose-response of HVRT was shown to
MD when more than two sessions per week were completed, the authors wrote

he first systematic review to address the effects of HVRT on BMD using DEXA as a
in older adults," the group wrote.

they noted the results should be treated with some caution. Nonetheless, the gr
cians may wish to encourage older adults to explore multimodal exercise program
hases of HVRT, as well as avoid periods of detraining longer than six months.

hould be considered in clinical practice, however it remains unclear as to what co
exercise program," the group concluded.

CLINICAL NEWS | WOMENS IMAGING | BREAST

CEM comparable to MRI in asymptomatic women

Amerigo Allegretto

Nov 15, 2023

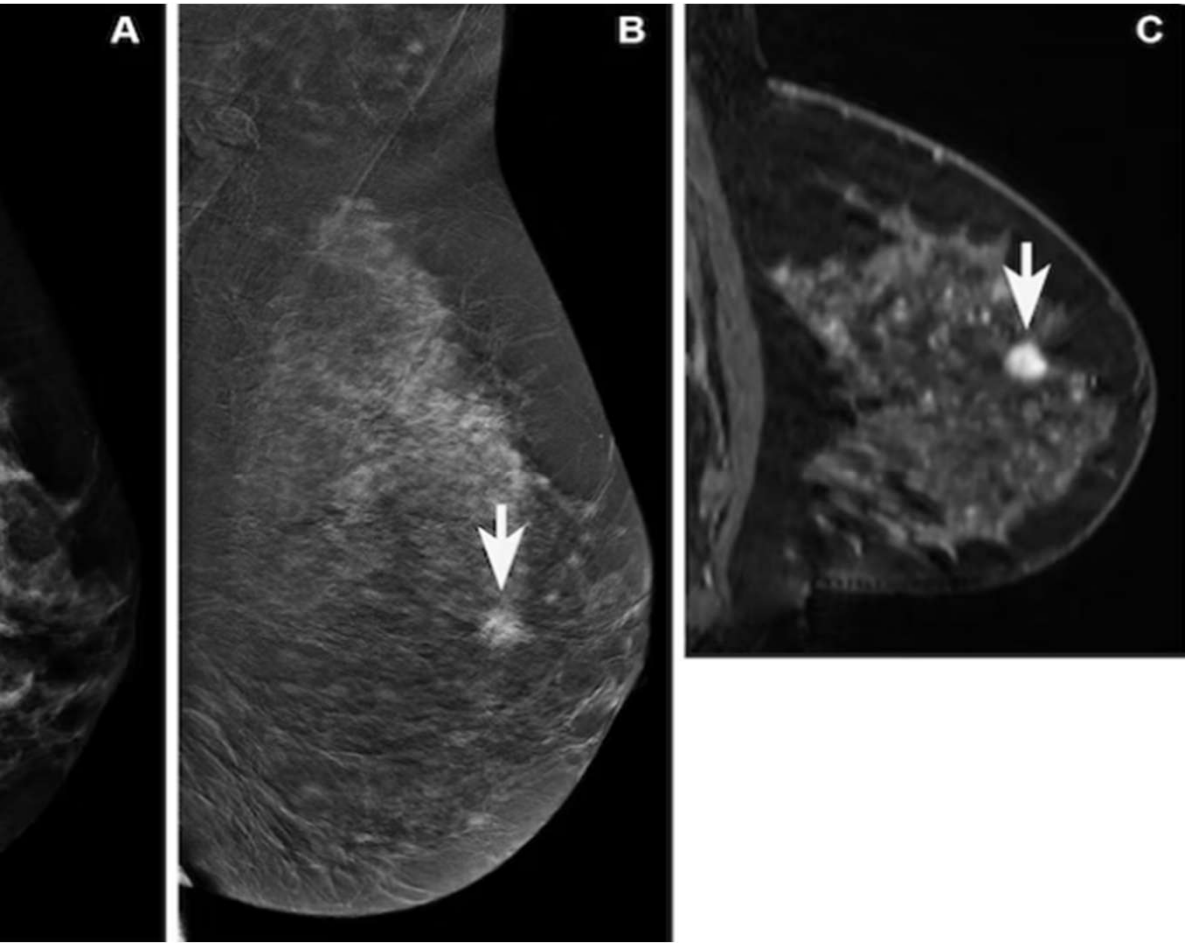
-enhanced mammography (CEM) is on par with MRI in breast
g for asymptomatic women, according to research published
er 14 in *Radiology*.

th demonstrating CEM's noninferiority to breast MRI, a team le
Phillips, MD, from the Beth Israel Deaconess Medical Center i
also found that CEM has a slight advantage over abbreviated M
, as well as superior performance to that of digital mammograp

dy serves as a key step in moving toward an MRI alternative t
te to high-quality cancer care," Phillips and colleagues wrote.

s studies have demonstrated the clinical utility of CEM in breas
g as a potential alternative to MRI. However, the Phillips team
ata comparing the respective performance of the modalities to

earchers investigated whether CEM is comparable to standard
abbreviated breast MRI for screening asymptomatic women, a
her it is superior to digital mammography.



A 47-year-old female participant with a sus
noted at screening tomosynthesis and sub
diagnostic ultrasound was recruited for co
enhanced mammography (CEM) and MRI
abnormality was noted on the conventiona
mammogram showing dense breast tissue
(arrows) was clearly observed on (B) the r
CEM image and (C) the MRI scan. Both in
marked background parenchymal enhanc
confirmed a 1.1-cm grade 2 invasive ducta
(estrogen receptor- and progesterone rec
human epidermal growth factor receptor 2
Image courtesy of *Radiology*.

nriched reader study used imaging data prospectively collected from asymptomatic women
on from 2014 to 2020, with 12 radiologists interpreting the images.
rpretation, the radiologists were first shown low-energy images as a surrogate for digital
y. From there, they provided a forced BI-RADS score for up to three abnormalities, with th
sed as the case score. After that, they reviewed the full CEM exam and scored it similarly.
-month washout, the radiologists interpreted abbreviated breast MRI and full MRI exams.

rs included data from 132 case sets. Of these, 74 were benign, 44 were malignant, and 14 were negative. The resea
M was noninferior to standard breast MRI and that digital mammography had inferior performance compared to the ot

Diagnostic performance of breast cancer screening modalities

Modality	Area under the curve (AUC)
CEM	0.91
MRI	0.91
Abbreviated breast MRI	0.89
Digital mammography	0.79

nalysis, the team reported that CEM had significantly higher performance than that of digita
hy for examining both dense and nondense breast tissue ($p = 0.02$ and $p < 0.001$, respect
CEM was on par with MRI and abbreviated breast MRI in diagnostic performance for both
ssue cases. CEM had AUC values of 0.89 and 0.94 for dense and nondense tissue, compa
of 0.89 and 0.95 for standard MRI, respectively. Abbreviated MRI meanwhile had AUC valu
dense and nondense breast tissue, respectively.

uthors highlighted that this study provides “important preliminary information for evaluating
ning option.” They also suggested that CEM’s performance may have been higher had digi
ather than the low-energy images of the same CEM exam as done in the study.

EWS | WOMENS IMAGING

omen prefer having female radiologists perform st ultrasound?

gretto

men undergoing breast ultrasound are unconcerned about whether a radiologist is
according to research published November 8 in *PLOS One*.

ed by Elisabeth Sartoretti, MD, from the University of Lucerne in Switzerland found
ree out of four women reported that it made no difference whether a female or ma
st performed a breast ultrasound exam.

appear that women examined by male radiologists are less selective about the se
g radiologist," Sartoretti and colleagues wrote.

archers noted that there is a trend toward fewer male radiologists who specialize
ultrasound included. They also pointed out a common notion that female patients
ble receiving breast ultrasound exams from female radiologists.

i and co-authors sought to explore the needs and preferences of women undergo
nd in a multicenter study regarding the sex of the radiologist performing the exam.
survey data from two centers. At one center, which included 72 patients, the wom
d by female radiologists only. At the other center, which included 100 patients, the
amined only by male radiologists.

archers found that 74% of the total women indicated that it made no difference wh
ng radiologist was male or female. Another 25% wanted a female radiologist while
l a male radiologist.

enter with only male radiologists, the researchers found that 93% of the women e
icated no preferences regarding the sex of the radiologist. Another 5% preferred b
d by a female radiologist and 2% preferred a male radiologist.

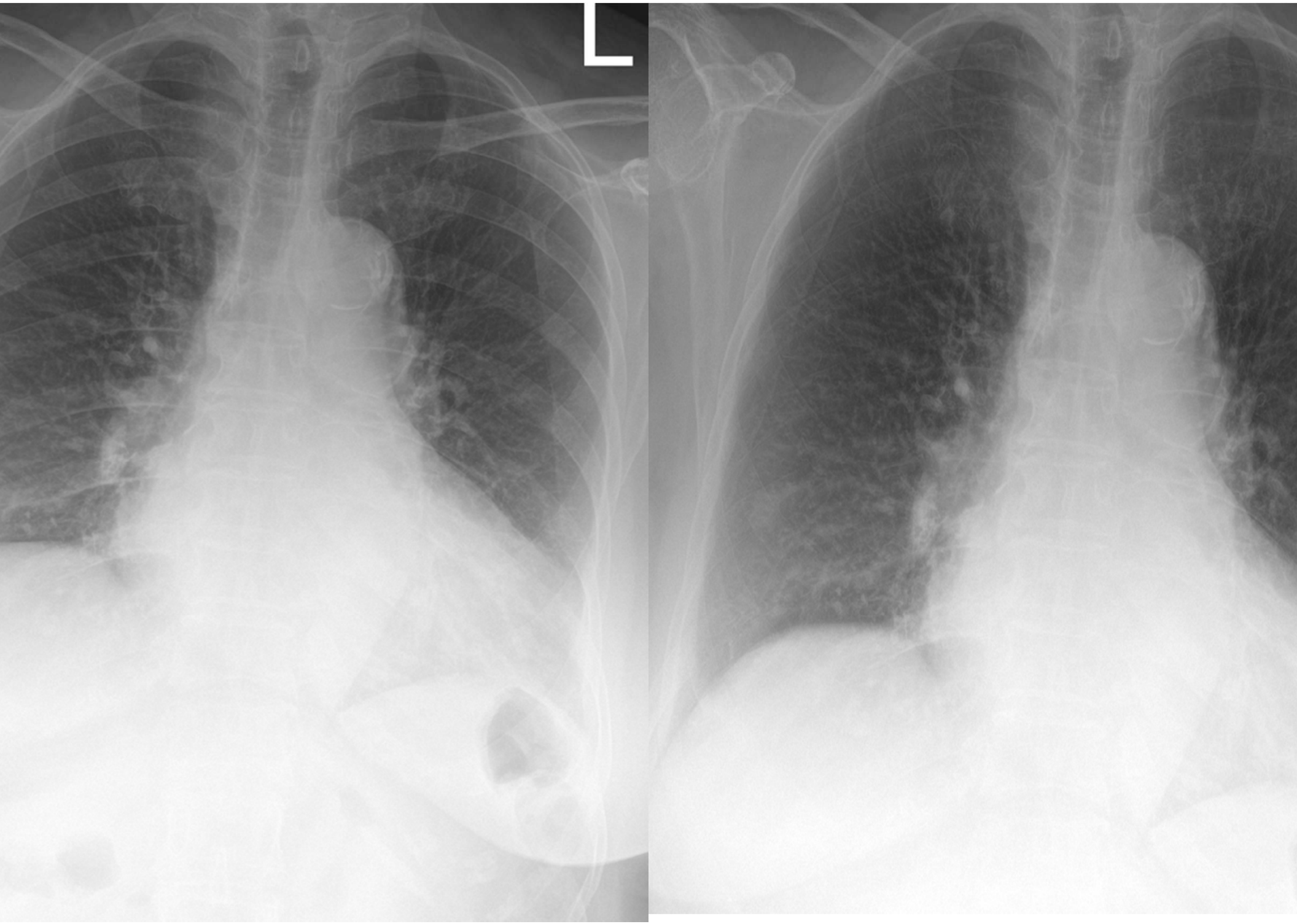
am suggested that based on these results, male and fema
gists should routinely ask patients whether they find the br
und exam setting acceptable.

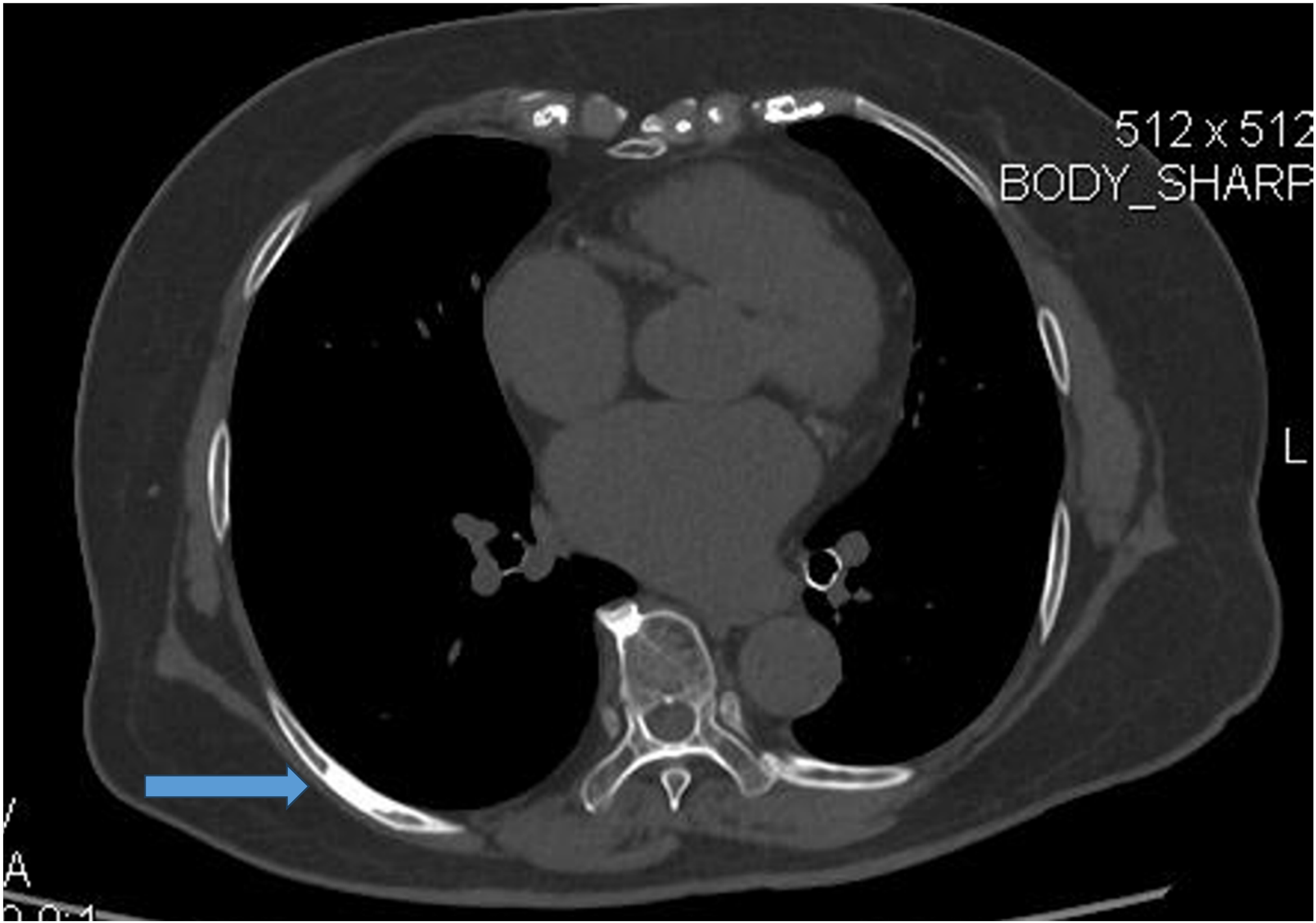
suggested that male radiologists have importance in this a
rowing incidence rates of male breast cancer, the growing
r of transgender women with hormonal stimulation, and th
ence of gynecomastia among men.

the fact that mixed patients cohorts are examined by spec
und teams, it would be appropriate to have male doctors in
gy teams," the study authors wrote.

thors also wrote that they are advocating for mutual tolera
orts to train more male specialists in this "fascinating and
singly important" subspecialty of radiology.

the patient's point of view, a competent radiologist is most
ne regardless of his or her sex," they added.

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BODY_SHARP
L
A