Is the Wayne Southwick Professor of Orthopedics and Rehabilitation and also Professor of Biomedical Engineering. His clinical interests are sarcoma complex musculoskeletal reconstruction in adults and children, musculoskeletal bone and soft tissue tumors, minimally invasive surgery for metastatic cancers to bone and spinal tumors. Doctor Lee has had several NIHRO funded research programs in metastatic cancer induced bone loss, fracture healing, regenerative orthopedics,
and bone infection.

His research focuses on high impact orthopedic research that’s directly relevant to pathogenesis, diagnosis and treatment of orthopedic disorders.

Dr. Lee holds the rare distinction of being both an orthopedic surgeon and a musculoskeletal scientist scholar working with NIH research programs.

And I’ve known Francis for many years now, so it’s my pleasure to introduce his talk today.

Good afternoon. I’m Francis Lee, and thank you so much for wonderful
introduction and also many people on Zoom. It’s really great to see you on Zoom as well.

And today I’m here really to provide service for your enhanced care and let me introduce our three orthopedic surgeons, Doctor Gary Friedlander, myself and Doctor Lynn Scogg.

And we do lots of a sarcoma surgeries and Dr. Ego Lattic is the interventional radiologist and we recently formed A-Team and we are providing lots of minimally invasive procedure for metastatic cancers. And our group is leading this new procedure nationally and internationally.

So this is a main topic.
The most important thing is about hip fractures, hip lesions, any patients with a bone Mets is a stage 4, but I believe this is a stage 5 pathological fracture or painful lesion around the hip is more disabling than stage 4 cancers. Traditionally orthopedic surgeons just to do surgeries for this kind of massive bone defect and the fracture in the roof of the hip joint called astabulum. But I'm taking different approach as a clinician scientist from oncology perspective, lots of cancers are chemo resistant and radio resistant. Radiation dose maxed out even after two courses of radiation and the.
local cancer body needs tremendous.

1ML of cancer contains 100 million cancer cells.

It’s a lot.

And also at the same time, bone cancer causes inflammation.

So any breast cancers or lung cancers cause inflammation in the bone release.

Pain mediators, inflammatory cytokines that destroy bone and inhibit bone formation.

Biomechanically, bone is weak and soft.

And this is what we do surgically.

But because of a big surgeries, sometimes patients miss opportunities.
to live longer from the surgical complications and the prolonged recovery. So our team has developed some kind of a surgery called Arif AORIF. This is ablation to kill cancer. We are providing local cancer control instantly on the day of procedure, we kill billions of cells. And also we are improving a bone cancer biology because we are killing the cancer. As a result, local bone homeostasis improves biomechanically. We are reinforcing the bone and the patient can emulate next day and the patient does not require admission and you can resume your chemotherapy right
away or radiation therapy the next day.
And as a result patients may live longer.
Over the past five years, our team has published about 10 papers and the most recent paper was published in radiology which is impacted fact is about 30.
And we are very actually proud of our collaboration with the medical oncologist such as Doctor Deshpande, Dr. Sharon, Dr. Gettinger and so many people. We are working together 24 hours and seven days by exchanging text.
And the goal of this grand round is to assure you we exist to really facilitate
your life saving oncologic care through innovative drugs or radiation.
And we are providing not just putting the nail or implants, we are providing comprehensive bone oncologic care to this end. Do not wait until patient breaks the bone, just call us all in the. Right away when you detect metastasis then we can get, we can kill cancers, reinforce the bone and I think medical oncology care will be further enhanced. And also today we’ll discuss some science as well. So if you consult this patient to orthopedic
surgeons depending on trauma surgeon or oncologic surgeon whoever the treatment. All really vary.
Some people put big implant, some people put plate and screws, but I don’t think this is the right way. I’m an orthotic surgeon, I know how to these surgeries but this is not the right surgery for patients with the metastatic bone disease. And this is some pictures from my surgery. Big exposure raming, massive reconstruction, but patients had the radiation, poor wound, healing, diabetes, infection.
At this point, oncologist, they cannot continue drug therapy because of complications. So I was thinking about what to do over the next 5 or 10 years. The way is really minimally invasive surgery. If you look at the case of AAA aneurysm or cardiac surgeries, most of the procedures are done now percutaneously, no more open heart surgery, no heart lung machine. So why not for at least for metastatic bone disease, you may recognize this famous painting by Pablo Picasso.
He was really, as you know, painting genius at age 15. He can draw like a photograph, but as he as time evolves, he became a really minimalist and we became a minimalist and we are leading the field. So Arif is metastasis specific procedure developed by our people. One of our patients patient is a 59 year old male with a massive bone destruction and a tumor. Orthopedic surgeons always look at the bone defect, but I’m an oncology surgeon and
I see huge cancer there and the cats can show massive bone defect. And if it open surgery, this is going to be a nightmare, requires 2 week of admission. CQ transfusion complication rate is about 50%. Patient is very obese as well. So this is the picture that I took during the surgery and this is the pelvic area and very small draping and this is the X-ray we are using at the York Street operating room. Since there are no surgeons in this audience, I’m going to skip the surgical procedure part.
But bottom line is we can do a lot of great things by using simple imaging studies. So first what we do is we put little pin forward the cancer to target the approach and this is the imaging studies we are using. And we are putting a guide wire, then putting a small screw through a 3 millimeter skin cut, no big skin incision and the Yale Cancer Centers Amazing imaging facility. This is a 3D imaging that is easily available in the operating room. Then I insert screws.
halfway through the pelvis.

And through the screw that has holes in the middle,

we can do a lot of things.

This is a device called the radiofrequency ablation.

Before I do any orthopedic procedure, we kill the cancers.

As I said, 1ML of a cancer contain 100 million cells.

This is a radiofrequency ablation.

And after ablation, sometimes we inject the dye then we see dyes leaking out and because of this reason we are doing balloon osteoplasty, meaning we are dilating balloon just
like a kyphoplasty so that Symantec can be deposited in the target region.

After balloon inflation and deflation, now we are injecting bone cement.

This bone cement generate heat about 95 degrees.

In addition, we are adding Zometa this phosphonate in the bone cement because this phosphonate unlike denosumab is heat stable and it had some protective bone effects.

So after ablation bone osteoplasty cement injections, then we are advanced screws.

as you see there,
there is no skin incision, only two or three insertion sites and this is what we did. Through that small incision we kill the cancer by radiofrequency ablation as well as thermal necrosis by bone cement. On top of it, we are also adding bisphosphonate to protect the bone. I was talking to that doctor dish pande whether we can mix some heat stable anti cancer drug like a methotrexate and hopefully that’ll happen in the very near future. So we are very proud of this procedure not because patient is walking but actually we killed
00:11:20.550 --> 00:11:23.976 billions of cancer cells during the

00:11:23.976 --> 00:11:26.418 procedure and this is addressing.

00:11:26.418 --> 00:11:28.753 This is the anesthesia record.

00:11:28.760 --> 00:11:32.040 This entire process took less than one hour.

00:11:32.040 --> 00:11:34.160 This is really game changer.

00:11:34.160 --> 00:11:37.100 And because of this patient can

00:11:37.100 --> 00:11:39.829 get new targeted or checkpoint

00:11:39.829 --> 00:11:42.517 inhibitors the next day.

00:11:42.520 --> 00:11:44.833 So let’s see how patient does in two weeks.

00:11:48.960 --> 00:11:52.400 Yeah, this is a two weeks after one.

00:11:52.400 --> 00:11:53.560 So the procedure works.

00:11:55.660 --> 00:11:56.900 And patient was very happy,

00:11:56.900 --> 00:11:59.684 but more importantly patient was able

00:11:59.684 --> 00:12:02.020 to receive chemotherapy without delay.

00:12:04.420 --> 00:12:06.085 And this is another patient
We know that prostate cancer sometimes make more bone, but it’s very irregular and also they do not undergo normal bone remodeling and they are, they suffer from pathological fractures.

Well this is a before and we did again same.

Minimally invasive Arif and this is 2 months follow.

This is Dr. Sharon’s patient. Patient has newly diagnosed. Stage 5 is my My terminology.

Stage five of breast cancer genetic chemotherapy right away but she cannot
walk and we did the Arif procedure.

The bottom line is not only we killed a lot of cancers, we stabilize the bone as well.

and this is a post of CAT scan showing nice coverage of defect in the astabular roof.

and patient is still alive and she regained full function.

Next patient is Doctor Scott Gellinger’s patient,

49 year old female with a lung cancer.

All drug therapies failed but he came up with one new drug and she needs new treatment.

However, the patient had left
00:13:39.935 --> 00:13:42.139 to femoral neck fracture,
NOTE Confidence: 0.930030428571429
00:13:42.140 --> 00:13:44.816 left astabular defect and the right
NOTE Confidence: 0.930030428571429
00:13:44.816 --> 00:13:47.180 astabulum and femoral neck defect.
NOTE Confidence: 0.930030428571429
00:13:47.180 --> 00:13:50.792 She’s very thin and fragile to receive
NOTE Confidence: 0.930030428571429
00:13:50.792 --> 00:13:53.376 bilateral total live arthroplasty.
NOTE Confidence: 0.930030428571429
00:13:53.380 --> 00:13:59.112 So we did simultaneous concurrent
NOTE Confidence: 0.930030428571429
00:13:59.112 --> 00:14:02.500 area of the astabulum and
NOTE Confidence: 0.930030428571429
00:14:02.500 --> 00:14:04.340 the femoral neck bilaterally.
NOTE Confidence: 0.940253536666667
00:14:06.860 --> 00:14:09.740 The case took about two hours.
NOTE Confidence: 0.940253536666667
00:14:09.740 --> 00:14:11.500 But look at this outcome.
NOTE Confidence: 0.940253536666667
00:14:11.500 --> 00:14:15.780 This is before one month and six months.
NOTE Confidence: 0.940253536666667
00:14:15.780 --> 00:14:17.780 She survived the seven months
NOTE Confidence: 0.940253536666667
00:14:17.780 --> 00:14:19.820 thankfully due to a really
NOTE Confidence: 0.940253536666667
00:14:19.820 --> 00:14:21.460 wonderful new drug therapy.
NOTE Confidence: 0.940253536666667
00:14:21.460 --> 00:14:23.620 And if you look at the PET scan before,
NOTE Confidence: 0.940253536666667
00:14:23.620 --> 00:14:26.140 you can see lots of SUV uptake,
but after Arif you can see decreased SUV uptake from cancer ablation and also bone cement derived thermal necrosis.

Our next patient is 89 or the male with the refractory myeloma. When I met him, he was really dying in the bed. He had the left acetabulum complete fracture, dislocation and L5A fracture. He cannot even see that.

So we did concurrent L5 and the left acetabular reconstruction and he was able to emulate and he survived several months while.
he's receiving new drug therapies.

Renal cell cancer is also a big problem. I interact with the doctor Joseph Kim and also Doctor Petrol lack.

Renal cell cancer is notorious for bleeding and if you do open surgeries, usually do embolization. The day before the surgery then we do hip replacement and even during that procedure after embolization, the bleeding is very tremendous.

So in this case we can do even concurrent. And geography and embolization and area for procedure in collaboration with the doctor Igor Lattic that I showed in my first slide.
So this is how our smile patients are doing after our innovative procedure and I’m available. Doc Lattic is available. So text me or email me, we would be happy to facilitate your oncology care. By providing all intervention, do not wait till the bone is broken. We can still kill the cancer and reinforce the bone right away.

You’re all smart cancer doctors and I’m sure you’re already tired of all the surgical cases. So let’s talk about some science why this area for procedure.
is really better or superior to conventional orthopedic procedure. This is the bone. And this is a very peaceful bone with a peaceful osteoblast and osteoclast. When breast, kidney and lung cancers go to bone, they convert this quiescent bone into inflammatory bone. And we did some work and we published this paper in Nature Bone Research because we failed to publish Nature Science, what still is a good impacted factor. And as you see here, this is MCF 7, Michigan Cancer Foundation cancer cell line,
MDA, MDA, Anderson cancer cell line. Cancer cells are transplantable. That means if orthopedic surgeons do reaming or spill all the cancers, they can grow anywhere. And this is only three-week after innoculation in the into the nude mouse tibia and the cancer cell growth is tremendous. In addition, this is a mouse fracture showing normal fracture healing. In mouse fracture healing is complete within three weeks, but in the presence of MDA 231 cancer cells,
fractures do not heal.

So if there's a pathological fracture already, there is no point of just putting the nail on. Somehow we have to do some local cancer control and if I just show some kind of a different diagram. Or it's too moving too fast.

This is the bone homeostasis. Osteocytes are the master regulator of a bone homeostasis and osteoclast are formed, as you know, in stimulation by rank ligand and MCSF, and those are produced predominantly by osteocytes.
And some by osteoblast and T cells and other cells. And the problem is that cancer cells produce rank ligand, produce MCSF, produce TNF alpha, and all the cytokines plus osteocytes regulate bone by inhibiting bone formation by producing sclerostine. And which inhibits actually went to fiber signaling. So this is sclerostine is a negative regulatable bone formation. And there’s a new drug called the romoszumab that actually can make a lot of new bones just like dinosumab.
00:19:11.430 --> 00:19:14.110 by stimulating more bone formation.
NOTE Confidence: 0.94427896
00:19:14.110 --> 00:19:15.490 The problem is cancer cells
NOTE Confidence: 0.94427896
00:19:15.490 --> 00:19:16.870 behave like a bone cells,
NOTE Confidence: 0.94427896
00:19:16.870 --> 00:19:18.590 Like a breast cancer cells,
NOTE Confidence: 0.94427896
00:19:18.590 --> 00:19:20.870 they make sclerostine as well.
NOTE Confidence: 0.94427896
00:19:20.870 --> 00:19:23.726 And This is why bisphosphonate or
NOTE Confidence: 0.94427896
00:19:23.726 --> 00:19:26.320 zometa do not work even though
NOTE Confidence: 0.94427896
00:19:26.320 --> 00:19:28.390 you give a zometa or dinosumab.
NOTE Confidence: 0.94427896
00:19:28.390 --> 00:19:32.308 You may suppress osteoclastic bone formation,
NOTE Confidence: 0.94427896
00:19:32.310 --> 00:19:33.130 but.
NOTE Confidence: 0.94427896
00:19:33.130 --> 00:19:37.860 You cannot really prevent cancer induced
NOTE Confidence: 0.94427896
00:19:37.860 --> 00:19:41.485 inhibition of osteoblastic bone formation.
NOTE Confidence: 0.94427896
00:19:41.490 --> 00:19:43.302 Radiation is very effective,
NOTE Confidence: 0.94427896
00:19:43.302 --> 00:19:45.567 but again it suppresses both.
NOTE Confidence: 0.94427896
00:19:45.570 --> 00:19:48.610 Osteoblastic bone formation is
NOTE Confidence: 0.94427896
00:19:48.610 --> 00:19:51.955 osteoclast and sometimes most of the
time kill cancer cells as well and
This is why we introduced ablation,
local cancer control by ablation.
So that we can cure cancer locally
without affecting surrounding
Osteoblast or Osteoclast.
I mean these days you are using
lots of a targeted therapies
like a met kinase inhibitor,
Ras inhibitor,
all those things I think they have a
great role because Osteoclast require
Mac Orca 1 to signaling MITF NF Kappa B.
Nuclear factor,
they activated the T cells,
C1NFC1 and all those actually transmission factors are targeted by your new drugs. So I think that certainly improves bone formation.

It’s not radio losing defect. There are billions of cancer cells in the bone and there is no point of watching. Just call us and we are going to kill instantly and we’ll make a bone by doing ablation.

Let me share how ablation works. This is I hope you don’t have a chicken sandwich today. This is a chicken and we are putting a radio frequency ablation probe unlike...
steak which requires very hot temperature.

Radiofrequency ablation delivers very low temperature, about 65 or 70 degrees over 15 minutes, so that we can protect the surrounding neurovascular structures. At the same time we can effectively induce cell necrosis within the target region. In addition, ablation therapy is known to enhance targeted therapy. So this is an example of hepatocellular carcinoma in mouse and actually they gave
radiofrequency ablation alone or in or better inhibitor and actually enhanced necrotic zone moreover ablation. Exposes antigen because it’s a low temperature by 65 degrees, we do not induce complete necrosis. As a result, all the tumor antigens can be exposed and that will enhance can be exposed and that will enhance your targeted antibody therapy. So this is really exciting and this is the publication by my colleague at Duke and also PD1 blockade actually improves bone mass as well. Because PD1 signaling is important during osteoclastogenesis.
So I think there are a lot of commonality if we work together. I think we can enhance not only bone health but actually we can prolong the survival as well.

So people measure the circulating cancer cells and the inflammatory cytokines and of after ablation in animals. Those circulating cancer cells and inflammatory cytokines decrease. So there are a lot of things going on beyond a physical killing of cancer cells. And it has been shown that ablation alone does not cause bone damage. So these are the biological
factors that I introduced and
briefly I’ll go over biomechanics,
why we are doing this small surgery
instead of doing big surgery.
So we are putting bone cement and screws
and we published one paper in the hip joint.
The effective wave bearing zone is very small. It’s a size of 1/4 and I
used to make 50 centimeter incision to
to really cure this small lesion and I
think that’s really nonsense these days.
And so we did a bio mechanical study.
And cement, small cement and screw
combination really restores the
biomechanical integrity of the pelvis.
So this is the scientific rationally and
we did a biomechanical study and screw alone or cement alone is not sufficient. But if we combine screws and the cement, we can restore a normal heat function immediately. So this is really a kind of scientific background. My last part of talk is about now clinical outcome, so do our patients survival longer than patients in other cancer centers. I was very curious and now I have some data indication of this procedure is really unlimited.
We can do any patients with a painful lesion. Or chemo or radiation resistant lesions, we can kill the cancer right away.

In astabulum we have about 70 patients cohort and many patients were better written or wheelchair bound. I devised a functional score guidelines because Ecog scale is only zero to four. It’s very vague. So the functional score is better written. And the functional pain score 3-4 wheelchair, assisted ambulation and independent ambulation. It’s very intriguing to see all.
the patients show very vertical improvement in pain in the functional score immediately within three months animations. Actually many patients live longer than one year and that function is retained. And if you look at the survival card, somehow those patients who received Arif procedure survived the longer than predicted the survival of path of fracture 3. This is AI driven big database, prolonged survival prediction tool and our smile of patients actually live longer. I mean this could be due to only functional ambulation that allowed.
New drug therapy right away, why could it be a combination of radiation, chemotherapy and all others, but also at the same time it could be due to massive cancer site reduction by ablation and the bone cementation. So now I'm really thinking our procedure is not palliative procedure, it's really lifesaving procedure and. For those patients who may not live longer than six months or a year, we are providing palliative care. But for those patients who live longer than one year, we are providing really functional cure and complication wise,
there are not many complications, no infection, no transfusion and the patients go home on the same day without any delay.

And 1 controversy in orthopedic surgery field is.

Protrugio that means femoral head already really forced into the acetabulum. This is a really big problem.

But we have about 14 patients with protrusional or protrusion and those patients also did very, very well.

This is our recent patient with a thyroid cancer, massive cancer metastasis and the pets
00:28:04.396 --> 00:28:07.660 can show that this increased uptake.
NOTE Confidence: 0.86921511625
00:28:07.660 --> 00:28:10.340 You can see femoral head through the pelvis.
NOTE Confidence: 0.937842368181818
00:28:14.040 --> 00:28:16.400 And we did minimally invasive
NOTE Confidence: 0.937842368181818
00:28:16.400 --> 00:28:19.160 procedure that took about one hour
NOTE Confidence: 0.937842368181818
00:28:19.160 --> 00:28:22.015 and patient was discharged and
NOTE Confidence: 0.937842368181818
00:28:22.015 --> 00:28:24.480 patient felt great right away.
NOTE Confidence: 0.937842368181818
00:28:24.480 --> 00:28:27.892 The pain was much less and this is
NOTE Confidence: 0.937842368181818
00:28:27.892 --> 00:28:30.316 before in the pre upholding area
NOTE Confidence: 0.931867373333333
00:28:33.520 --> 00:28:35.158 and this is in two weeks.
NOTE Confidence: 0.922680552222222
00:28:39.490 --> 00:28:41.002 He has not been working for a long time.
NOTE Confidence: 0.922680552222222
00:28:41.010 --> 00:28:42.298 There’s a muscle atrophy,
NOTE Confidence: 0.922680552222222
00:28:42.298 --> 00:28:45.436 but at the same time he was able to
NOTE Confidence: 0.922680552222222
00:28:45.436 --> 00:28:47.326 really move much more comfortably.
NOTE Confidence: 0.922680552222222
00:28:47.330 --> 00:28:48.770 And I’m collaborating with
NOTE Confidence: 0.922680552222222
00:28:48.770 --> 00:28:49.850 the radiation oncology.
NOTE Confidence: 0.922680552222222
00:28:49.850 --> 00:28:51.962 They can actually do more radiation
00:28:51.962 → 00:28:53.890 to cover the entire pelvis.

00:28:53.890 → 00:28:56.438 My part was to save the wave bearing as tablet and the medical oncologist will give drug therapies.

00:28:56.438 → 00:28:59.615 Now let me talk about bone mass.

00:29:03.090 → 00:29:07.840 We talk about bone biology.

00:29:07.840 → 00:29:12.680 So what happens to born after Arif?

00:29:12.680 → 00:29:15.676 And this is the our patient again, 64 year old woman with a breast.

00:29:15.680 → 00:29:20.673 cancer she presented with a breast.

00:29:20.673 → 00:29:23.920 cancer cat scan showed no born at.

00:29:23.920 → 00:29:26.080 all and this is a do Nova cancer,

00:29:26.080 → 00:29:27.640 no prior chemotherapy.

00:29:27.640 → 00:29:30.760 So we did a temporary Arif.

00:29:30.760 → 00:29:32.200 I was a doubtful.
Whether this procedure will last three months, six months, I was nervous. Each time she comes to my office, I'm praying please. And actually surprisingly she was really ambulating very well. But at the same time, look at the bone, the bone mass change is really unbelievable. There was no bone, lots of bones after massive ablation and the cementation, of course she received the chemotherapy. But interesting thing is. This pelvis was very well protected and preserved, but she developed lots of a new
osteolitic metastasis in other bones.
So I think we are doing something good to the bone and to the cancer.
So we did some little clinical studies by measuring Ponsfield unit change on CAT scan and as you know air.
There is like a zero and maximum house filled units like a 4000.
We can quantify screws, cement, cancellosy bone, cortical bone and the Cancelladen fibrous defect.
And this is the Spigotti plot showing house filled unit changes over time in about 20 patient cohort who had a CAT scan.
Before the procedure,
three months after the procedure
and one year after the procedure
and we can easily recognize upward slope suggesting improved bone mass.
And this is a most striking preliminary finding for those patients who showed 10% improvement over bone mass or a hands free unit on CAT scan show prolonged survival. So I think really bodies are kind of cancer biomarker, but there’s also could be a kind of a prognostic indicator as well. And interestingly chemotherapy or other metastasis do
not really correlate very well and those patients usually die of multiple organ metastasis rather than this bone healthy self. Among those 70 patients, we only had one patient who required hemiaferoplasty and this patient had a myeloma that did not respond well to myeloma therapy as you reckon. Recognize bone reconstitution is not really complete and later he wanted to have a hemiaferoplasty after myeloma was finally working. He is now very happy and he can even run.
that required arthroplasty after our minimally invasive procedure. So regarding astabulum, Arif is a very safe, effective now I can really say first line treatment. It should be the first line treatment before formal open orthopedic procedure is concerned. So don’t be afraid of orthopedic surgeons. We’re not going to create any infections or complications. They may delay your chemotherapy just to text me or e-mail me. Then our team will coordinate care right away.
And we are doing similar things for the femoral neck fracture.

Traditionally we put hemi after A plus your long nails and nowadays we are doing a kind of very short mini area for the femoral neck and the advantage is that we can avoid or gain lots of medical complications, shorter procedure time and the blood loss is much less. Length of stage is also much much less.

For the IM nail, I really apologize as an orthopedic.
surgeon we put IM nail for those patients who have large Osteo lesions in the femur and. Our Intrametalline nail is a nice New York subway or monorail that transport all the cancer cells all over the place. And because of the pressure, the circulating cancer cells also increase as well. So these days we try to kill the cancer first because a lot of patients already had the radiation. We know that radiation didn’t work, chemotherapy didn’t work, so now we are killing cancer and we do the orthopedic procedure.
Very intriguingly, again just we learned from science, once we kill the cancer, local bone mass increases even without radiation or additional chemotherapy. So in summary, this is my final slide. I’m here to really introduce our service. We are really here to share. Our ability to facilitate, facilitate your oncology care, not to share our new surgical techniques and we provide comprehensive bone care. We are not just fixing the bone, we are killing the cancer and we
are changing local bone biology.

So please do not wait until bone is broken.

Please get us involved early so that we can actually avoid any surgeries in the future.

And thank you so much for this wonderful opportunity.

Thank you.

So any questions from anyone in the audience? Do we have, Oh yes, we didn’t apply this technology.

We didn’t apply this technology.

I know what and
what could be the reason for tumor shrinkage which was not exposed to this procedure.

Thank you. So we are asking every scope or effect. And in our case, it’s very, very interesting that even though local cancer control is well preserved, patients develop oscillating metastasis in other bones. So that means I think a lot of cancers have a really different chronological biology. So even though I have a great cancer control and some patients receive chemotherapy and all bones become really wide great improvement,
then there are new, probably cancer clones that cause new bone inflammation and bone destruction happens.

So to answer your question, I do not know the answer.

Do you have any hypothesis on your end? By the way, could you kindly introduce yourself so that people know who my name is Jung Chi Chan, pharmacology professor. Or you you developed a new drug, right? Yes. Thank you. Also, please introduce your new amazing drug as well.

I’m just coming back you and almost at the end of your talk,
00:36:57.850 --> 00:37:00.100 you start to talk about killing the tumor cells first.
00:37:02.350 --> 00:37:03.414 Then do your procedure.
00:37:03.414 --> 00:37:04.744 Is that what you’re saying?
00:37:07.855 --> 00:37:09.960 Y es, if you do that where you see Nas Metasta says potential of this procedure
00:37:10.060 --> 00:37:12.588 kill the tumor cell then apply your procedure.
00:37:14.990 --> 00:37:16.968 kill the tumor cell then
00:37:16.968 --> 00:37:18.546 apply your procedure.
00:37:18.550 --> 00:37:23.190 The reason I’m asking is your procedure actually is not only trigger the
00:37:23.190 --> 00:37:26.730 local event at the site of procedure.
00:37:30.890 --> 00:37:33.290 You may actually trigger the
00:37:33.290 --> 00:37:36.490 system wise immuno function, yes.
00:37:36.490 --> 00:37:40.498 And that immuno function may be
beneficial with the patients and the even at the site which tumor may metastasize too. Yeah the previously we always talk about a target oriented approach I think for cancer treatment we start to think. Much more system wide approaching controlling the tumor cells. Thank you. So I’m waking up a sleeping tiger. So exactly why you said Doctor Chan, we actually exposing a lot of antigens and release a lot of intracellular factors so that your new drug therapies and also host immune system can fight against the cancer.
But I do not see all as a positive results but at least in our patients surprisingly they really live longer.
And the regarding a secondary meth from bone to other organs, this is a very similar concept to like a dormant cancer by you know doctor Masago and Dr. even Kang. Yeah I think that really happens as well those any. So bone is the, I think the largest organ cancer reservoir in bone next to skin. So I think a decreasing cancer burning in bone is clinically very important.
Hey, thank you. Any other questions.

Over the years we have in medical oncology gone from treating cancer with chemotherapy and radiation and not isolating treatment for individual metastatic lesions to now. Being very, very aggressive and treating metastatic sites much more aggressively. Is this something you’ve seen as well? Yeah, I mean that’s I really share that same philosophy. If you have a patients with the five lung nodules, sometimes they take out because they call it oligo metastasis.
But when patients develop bone meds, a lot of cancer doctors or patients give up and the probably it’s time to change our approach. We can be more aggressive without doing any harm on the patients by doing minimally invasive procedure. Okay. Thank you any other questions in that case. Thank you Francis again for a great talk.