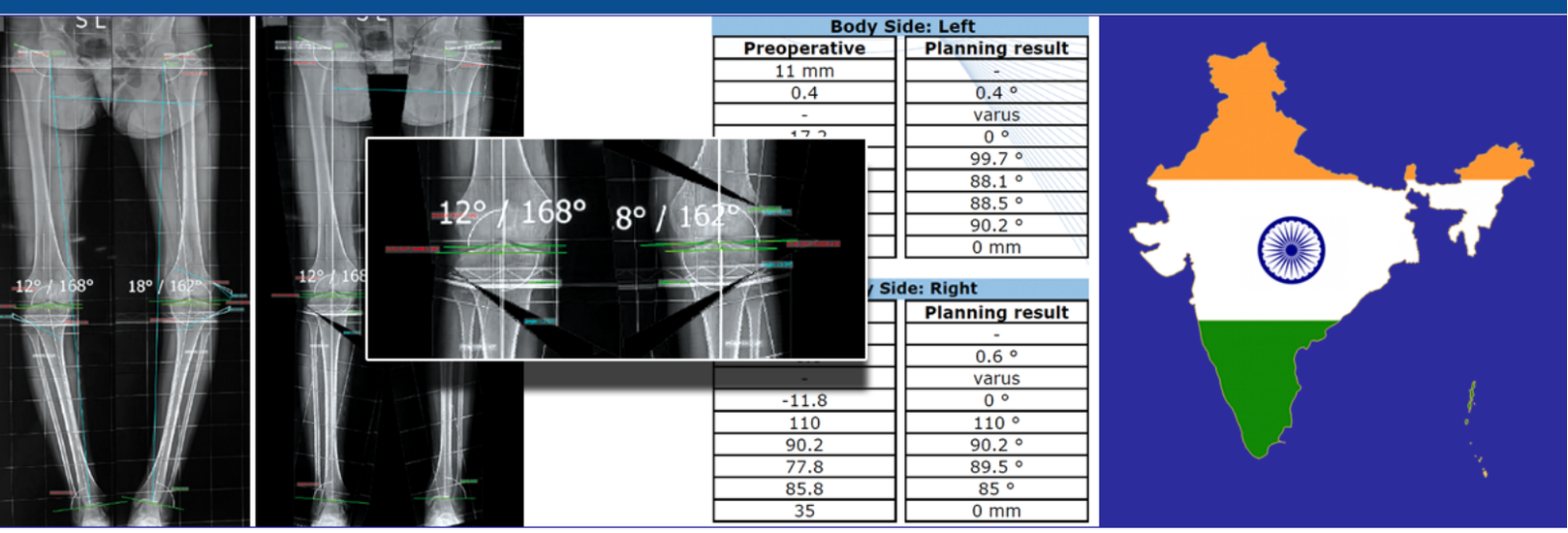
Digital preoperative planning The future in orthopedic surgery in India as well?

A report with Dr. Purav Kansara, Expert in limb lengthening and deformity correction



mediCAD®

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With an estimated population of 1.36 billion (2020), India is the most populous country in the world after China. When researching health care, results show diseases such as diabetes, malaria or leprosy. However, reliable figures on the distribution of these diseases cannot be found. This is also true for orthopedic diseases. Experienced Indian orthopedic & trauma surgeons estimate that the most commonly acquired limb deformities to be treated in India are malunion and pseudoarthrosis of the tibia and femur, as well as growth plate injuries and early cases of knee osteoarthritis which require a corrective knee osteotomy.

The majority of the three types of deformity occur in adulthood and are most frequently treated in the field of orthopedic surgery. Congenital deformities are mainly treated in pediatric orthopedics. Acquired and congenital deformities have in common that their correction must be accurately planned preoperatively. In many counties in the past, planning with physical templates was mainly performed analog. Nowadays, the digital era has also arrived in the operating room and some surgeons already use digital planning software. Especially in Europe, digital planning is becoming increasingly standard in orthopedic surgery.

However, the situation is still very different worldwide. In some countries, digital planning is still in its infancy. Dr. Kansara, who has recently started working with mediCAD 2D and is an expert in limb lengthening and deformity correction, shares us his experience on the status of digital preoperative planning in India.

Dr. Purav Kansara

mediCAD®:

Dr. Kansara you are practicing both in your own capacity and Anant Orthopedic and Superspeciality Hospital. What is your medical focus?

Dr. Purav Kansara:

I'm specialized in deformity correction and limb lengthening. I'm working in this field for 6 years.

mediCAD®:

How many surgeries do you perform on average (per day / per month / per year)?

Dr. Purav Kansara:

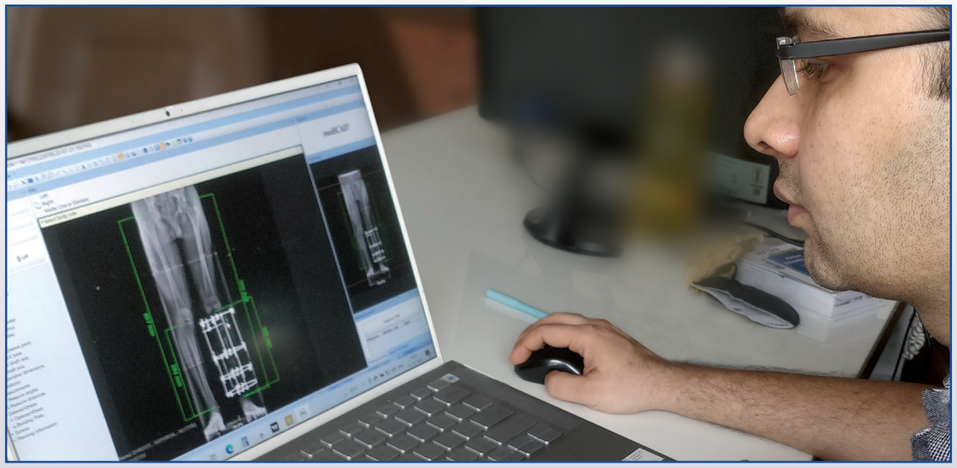
On average, I perform 15 surgeries per month. Of these, about 5 are deformity corrections and 10 are nonunion operations.

mediCAD®:

Do you work alone, or do you have a team of orthopedic surgeons with whom you work with at the clinic?

Dr. Purav Kansara:

I work alone. There is no other orthopedic surgeon associated with me as a full timer. However, 80% of cases which I operate have been referred to me by some orthopedic doctor, that orthopedic surgeon participates in treatment of that given patient.



The precise planning is convincing

mediCAD®:

Preoperative planning is nowadays mandatory in Germany and many other European countries. This is not yet the case in India and other foreign nations. Why do you plan digitally and not still „classically“ in analog?

Dr. Purav Kansara:

Because digital planning is more accurate. Multiple plannings with the same file is possible. That's impossible when drawing lines on actual x rays. The communication is fast, I mean if I want to show my plan to someone then digital planning is more effective. Furthermore, I don't have to wait for x-ray to come to me as a hard copy so patient doesn't have to come to bring me their x-ray, just my radiologist sends DICOM file and I can start planning. Additionally, the storage of images is easy and doesn't require big files.

mediCAD®:

Please tell us a bit about your CV and your professional career.

Dr. Purav Kansara:

I started my study at M.P.Shah Medical College, Jamnagar. Saurashtra University (Gujarat, India). I realized my interest in orthopedics very early and wrote my thesis about "Outcome of Pediatric Shaft Femur Fracture Treated by Intramedullary Nailing (6 to 12 years age)". To become more experienced, I started my carrier as a "Consultant Orthopedic Surgeon" at Lion's Trust Hospital, Mehsana, Gujarat (From November 2012 to May 2013) and "Consultant Orthopedic Surgeon" at BAPS Yogiji Maharaj Hospital, Ahmedabad, Gujarat (July 2015 to January 2016).

Now I'm working as "Limb Lengthening and Deformity Correction Surgeon" in Orthocure Hospital, Ahmedabad, Gujarat as well as a "Visiting Surgeon" (Limb Lengthening and Deformity Correction Specialist) at C U Shah Medical College and Hospital, Surendranagar, Gujarat. In total, I'm experienced in the field of limb lengthening and deformity correction for 6 years.

mediCAD®:

How would you try to convince a colleague who is still traditionally planning analog, to use digital planning software?

Dr. Purav Kansara:

I would explain him above mentioned benefits of mediCAD®. In particular, the more precise planning is a convincing argument in my opinion and the results explain themselves.

mediCAD®:

Do you believe digital preoperative planning will become a standard worldwide?

Dr. Purav Kansara:

Medical progress is coming in every part of the world, so I believe digital preoperative planning will definitely become a standard procedure worldwide.

The patient values the accuracy of the computer

mediCAD®:

In your opinion, what are the requirements for digital preoperative planning to be distributed in a more standardized way? (e.g. will a cloud-based version like mediCAD® Web help, Server/Client in Hospitals, Individual User Installation?)

Dr. Purav Kansara:

I think for India if a software works offline is better because network connectivity is not as efficient as more developed countries.

mediCAD®:

How does digital planning differ from traditional planning and what are the advantages? From the patient's and from the doctors/clinic perspective.

Dr. Purav Kansara:

Patient appreciates the accuracy of diggital over manual planning.
As I mentioned, the accuracy of digital planning, the time saved and easy sharing and storing of images for me are the clear advantages of digital planninng vs manual.

mediCAD®:

For how long have you used mediCAD® 2D and which modules are you using and for which cases?

Dr. Purav Kansara:

I used it for 8 months. I use it for long leg osteotomy planning for deformity and leg lengthening cases and also for knee osteotomy.

mediCAD®:

Do you use the software for every upcoming operation or only in special cases?

Dr. Purav Kansara:

I use it for all osteotomy cases.

mediCAD®:

Which are the advantages to point out?

Dr. Purav Kansara:

It helps to avoid unwanted deformities which occur when surgery is done without planning.

I am 100% satisfied with mediCAD®

mediCAD®:

How long do you need to do a planning in average?

Dr. Purav Kansara:

I'm quite fast. In average I need 10 to 15 minutes to plan a case.

mediCAD®:

Why have you chosen mediCAD®? What would you say are the advantages of this planning software in comparison to other products on the market?

Dr. Purav Kansara:

I have not used any other software except mediCAD®, so I cannot compare the advantages of the products. I was aware of competing products, but they are very expensive. Therefore, I was still going on looking for an option and to exchange ideas with colleagues. After a few conversations, I became aware of mediCAD®. mediCAD® offers an excellent price/performance ratio. Currently, I am 100% satisfied with mediCAD®.

mediCAD®:

Please give your notes on how we could improve our software, this could be anything from additional measurements to user interface.

Dr. Purav Kansara:

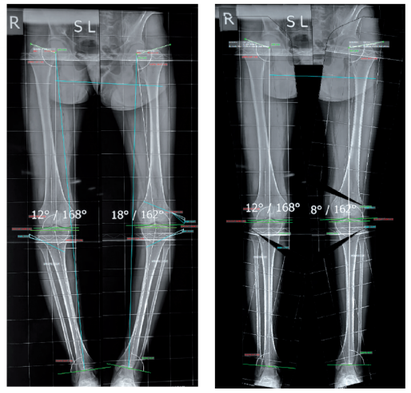
The only thing that bothers me is that the calibration marker is not displayed. It's there in DICOM image but for some reason it doesn't appear in mediCAD®. This is the only issue I am facing with mediCAD®.

mediCAD®:

Please give any additional comments that you may have.

Dr. Purav Kansara:

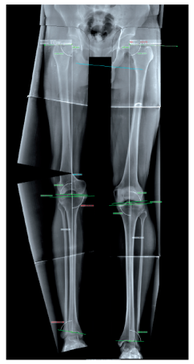
No additional comments, but I would certainly advise that digital planning software should be used from training days for any orthopedic surgeon. Companies should hold seminars in medical collages under title of *"advantages of digital planning in traumatology and deformity planning-how it gives edge to the operative technique"*.



Body Side: Left		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	11 mm	-
JLCA	0.4	0.4 °
Leg Deformity	-	varus
mFA-mTA	-17.2	0 °
mLPFA	100.3	99.7 °
mLDFA	95.7	88.1 °
mMPTA	78.9	88.5 °
mLDTA	90.7	90.2 °
MAD	50	0 mm

Body Side: Right		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	11 mm	-
JLCA	-0.6	0.6 °
Leg Deformity	-	varus
mFA-mTA	-11.8	0 °
mLPFA	110	110 °
mLDFA	90.2	90.2 °
mMPTA	77.8	89.5 °
mLDTA	85.8	85 °
MAD	35	0 mm

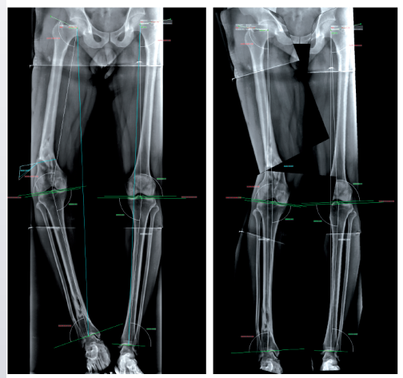
Plan: right leg: medial opening wedge HTO
left leg: medial opening wedge HTO and medial opening wedge DFO



Body Side: Left		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	40 mm	-
JLCA	1.5 °	-
Leg Deformity	varus	-
mFA-mTA	-0.3 °	-
mLPFA	87.7 °	-
mLDFA	85.3 °	-
mMPTA	86.4 °	-
mLDTA	90.4 °	-
MAD	1 mm	-

Body Side: Right		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	40 mm	-
JLCA	2.5	2.5 °
Leg Deformity	-	valgus
mFA-mTA	18.3	0 °
mLPFA	85.7	88.6 °
mLDFA	70.9	89.2 °
mMPTA	91.6	91.6 °
mLDTA	80.8	80.8 °
MAD	-64	0 mm

Plan: right leg lateral opening wedge DFO



Body Side: Left		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	34 mm	-
JLCA	0.5 °	-
Leg Deformity	varus	-
mFA-mTA	-5.2 °	-
mLPFA	99.8 °	-
mLDFA	89.7 °	-
mMPTA	85 °	-
mLDTA	88.8 °	-
MAD	19 mm	-

Body Side: Right		
Measurements	**Preoperative**	**Planning result**
Leg Length Difference	34 mm	-
JLCA	0.9	0.9 °
Leg Deformity	-	valgus
mFA-mTA	-22.8	3.6 °
mLPFA	105.3	99.8 °
mLDFA	106.9	80.5 °
mMPTA	85	85 °
mLDTA	95.4	95.4 °
MAD	81	13 mm

Plan: right leg medial opening wedge DFO

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