Prof. Pietro Ruggieri shares his views on his life and years as Musculoskeletal Oncology Surgeon

Interview of Prof. Pietro Ruggieri

Questions designed by Dr Yogesh Panchwagh (YP) and Dr Ashok Shyam (AS) and answers (too openly given) by Prof. Pietro Ruggieri (PR), Edited by Dr Anna Breda.

YP: Let me begin by asking you about your family background. Tell us something about your family and where you grew up? Tell us about your parents and siblings

PR: I was born in the deep south of Italy in a town called Taranto. My father was (and still is!) a doctor, his father was a doctor, and his grandfather was a doctor as well. He was an internal medicine doctor, but he got several specializations (hematology, chemotherapy, metabolic diseases). My mother was a teacher at High School, he had a degree in Literature and in Theology, as well.

My brother, who is 3 years older, is also as doctor and an orthopaedic surgeon in Torino, while my sister (younger than me) studied Biology

AS: So how did you decide to become a doctor, how did you get the inspiration?

PR: I think I always wanted to be a doctor, but I basically wanted to be a heart surgeon. Regrettably, I had to change my mind later during my studies.

AS: You did your Medical graduation at the University of Bologna. Please share with us some of your experiences at the medical?

PR: I studied Medicine at University of Bologna and graduated in 1982. During my studies I started very early visiting at Rizzoli Institute, where my uncle was chief of the Traumatology and Adult Reconstruction Department. He pushed me to go with him to his O.R. when I was 18 before I even started my first lessons. Therefore, this is the explanation of why "unfortunately" I was distracted from my wish of being a heart surgeon. The worst part of it was that a few years later I used to work on Friday in a private clinic with Prof. Campanacci as an orthopaedic surgeon while in the O.R. close to ours there was the best heart surgeon of University of Bologna!

AS: And then, during medical school were there any influences that helped or formed your career?

PR: I was impressed by the personality of my teacher of internal medicine, Prof. Gasbarrini, who with the example showed to us the most important things that a teacher should transfer to his students: the enthusiasm and the passion. Another strong personality that influenced me was, of course, my uncle's one, Prof. Francesco R., who was a superb traumatology surgeon and one of the first orthopaedic surgeons to implant

Prof. Pietro Ruggieri.

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a hip prosthesis in Italy

AS: So why did you choose orthopaedics as a career?

PR: Consequently, under influence OF Prof. Francesco I decided to be an orthopaedic surgeon

AS: Who would you say, once you started orthopaedics as a registrar, were your early influences? Any world figure is orthopaedics that influenced you as a student?

PR: I did my medical degree thesis with Prof. Campanacci: he was a profound man with a heightened personality, a man of very few words that always encouraged me as well as all of his pupils to study a lot and be devoted to research. In the 80's he certainly was one of the 3 pioneers of orthopaedic oncology together with Prof. Enneking and Prof. Mankin.

Through Prof. Campanacci I had the possibility to know these great orthopaedic surgeons and researchers, and they certainly played a major role in influencing my attitude to studying orthopaedic oncology. Prof. Campanacci was the first to claim the necessity of a multidisciplinary approach in the treatment of musculoskeletal tumours, where orthopaedic surgeons co-work and interact with the medicine oncologists, the radiologists, the pathologists, the general surgeons, etc. His successor and also my other teacher and very good friend, Prof. Mario Mercuri, learnt so well Campanacci's lesson that he used to repeat (although he was one of the best surgeons I ever saw) that: "Musculoskeletal tumours cannot be cured by the knife!".

AS: Your time after passing MD? Various fellowships and mentors

PR:

1) After my medicine graduation, I did my orthopaedic residency with Prof. Campanacci at Rizzoli Institute, but the last year he sent me over as a fellow to Prof. Enneking's Department at University of Florida - Gainesville. It was the year of Prof. Enneking's retirement and so I was visiting with Dr. Dempsey Springfield. A very intense period of new wind in musculoskeletal oncology with increasing role of conservative surgery and new types of reconstructions..

AS: You were also at hospital for special surgery for some time. Please share with us your experiences there?

PR: After my fellowship at University of Florida, where I had the chance of completing some projects and writing some papers, I then visited in New York the Sloan Kettering Cancer Center where at that time Dr. Marcove was retiring, and Dr. Joe Lane and the "young" John Healey were doing most of the bone tumors work. I had few opportunities of being at hospital for special surgery where I essentially went for the metabolic disease clinic of Dr. Lane and a few private surgeries from the doctors of the SKCC.

YP: We have one of very famous Indian orthopaedic surgeon Dr C S Ranawat also at HSS in the same years around 1987. Did you had any interactions with him?

PR: Since my HSS Fellowship was more of Metabolic Disease, I did not have the possibility to really interact with the famous Dr. C. S. Ranawat, although I was impressed by some of his lectures.

YP: You spend a good number of years in Mayo clinic? It is one of the most premier institutes in orthopaedics in the world. Please share with us your experiences about mayo?

PR: The most formative fellowship of my education was at Mayo Clinic under the guidance of Franklin Hindson Sim. This very tough man, who received me first with the question: «How do you want me to treat you? I mean: as a junior staff at Rizzoli or as one of my residents? », became over the time my true mentor and a person that I am deeply indebted with, both from the professional and the human standpoint, since he gave me the gift of making me confident in myself and a much better person than I was before meeting him. Not only is he an excellent surgeon, but also an outstanding person and professor. He taught me most that I am able to do now and I learnt from him that "Motivation is the key" (F.H.S.).

Another important lesson that I learnt from Dr. Sim, later and now my friend Frank (but he is still my mentor!), is that we have to apprehend by our mistakes. In fact, he has always quoted Sir William Osler's sentence: "Every case has its lesson … .but that is not always learnt". Beside Dr. Sim, the whole Mayo Clinic was a discovery: everything was so well organized and nothing left to the chance. Every day at Mayo there were meetings to update everybody's knowledge and share interesting cases. Moreover, you could breathe the air of respect and

dignity in working and studying.

AS: You are now a visiting professor at Mayo. Mayo clinic has a very different culture as compared to other such centres. Can you please elaborate about this culture?

PR: You can imagine how I felt after 24 years being appointed and invited as Visiting Professor at Mayo Clinic in September 2015 and spending one week in Frank Sim's house, watching TV together until very late. The culture of Mayo Clinic is based on the 3 indissoluble elements of research, teaching and assistance to patients, in addition to a perfect organization. I still remember that when I first visited with Frank Sim and he told me: "Here we use the Socratic way of teaching: while teaching, we are learning".

Moreover, I was fascinated by the constant capability of this man to interact with his fellows and ex-fellows forever: I am one of them and I perfectly know that Frank Sim has always followed each one of us during all of our progresses and careers. What I learnt from him, I have tried to apply to my relationship with my fellows: I have trained over 65 fellows in Orthopaedic Oncology from all over the world and especially now that with the technology is easier I am always interacting with them, trying to follow their careers, exchanging information and opinions on most interesting cases.

YP: How is orthopaedics in USA different from that in Italy?

PR: In the old days, there was a huge difference in Orthopaedics between US and Italy. Luckily over the time, this difference has been reducing and the approach and organization at least in the best orthopaedic centers is quite similar

YP: You did Ph. D. in Oncology at University of Bologna. Why choose oncology? I mean such choices are most of the time determined by great personal attachment to the subject of a mentor? What was the case with you?

PR: After my residency and Board Orthopaedics I was encouraged by Prof. Campanacci to do a PhD in Oncology at University of Bologna. It was early summer of 1987 and I was in New York visiting at SKCC, supposing to stay there for some further months, when suddenly the phone rang and Prof. Campanacci ordered me: "Tomorrow early morning go to Alitalia and take the first ticket to fly back to Italy: I want you to apply for a PhD in Oncology". No much chance to reply! At 7:00 am. next morning I was buying a ticket to fly to Italy. So my answer to your question about choosing to do a PhD in Oncology is clearly explained up here!

AS: You also worked with Dr. W. Enneking for sometime at university of Florida. What was he like a person?

PR: When I was a fellow at University of Florida, I had the chance to know better Dr. W. Enneking whom I had previously met at Rizzoli Institute: a very strong personality, a great teacher, the person who simplifies to his students even the most difficult issue.

AS: His contributions to musculoskeletal oncology have been enormous. Please share with us something about his passion for musculoskeletal oncology?

PR: His contribution to musculoskeletal oncology is well-known to all of us. Particularly I was mesmerized by his passion in teaching. When he ran his courses at University of Florida and later at Rizzoli Institute together with Prof. Campanacci, he was really devoted and tireless. He basically ran the course all by himself, teaching about radiology, surgery and pathology, trying to explain us the spirit of a Course with these words: "To me Course is a symphony, where every instrument is playing the same tune". What he had in common with Prof. Campanacci was the effort to describe and analyze the different features of orthopaedic diseases moving from the histopathology to the explanation of the radiologic features and symptoms: all colors depicting the same picture.

AS: You have also worked with Dr Campanacci? Please share some experiences about him

PR: With Prof. Campanacci, I have shared unforgettable experiences and many are the stories that I could remind here. Nevertheless, they would diminish the value of our relationship and his incomparable figure of Teacher. He was taught us that we should always be serious and consistent in our profession

YP: You also worked with Franklin H. Sim at Mayo an also other across the globe? Does this form a lifelong bond? How important is such mentorship and network specially in field of orthopaedic oncology

PR: As I already pointed out above, my relationship with F.H. Sim was unique and the most formative one. Of

course, this forms a lifelong bond and such mentorship is life-lasting and determining in the field of orthopaedic oncology. We ex-fellows of F.H.S. use to say that "once you have been on FS's service, you stay on his service for the rest of your life", and actually I am still on!

YP: What was your first clinical post in field of orthopaedic oncology?

PR: My first role in Prof. Campanacci's Department was as Assistant Professor in 1990.

YP: What are your main areas of focus in orthopaedic oncology?

PR: My main areas of interest in orthopaedic oncology are reconstructive techniques, and especially pelvic Tumor surgery.

YP: Orthopaedic oncology is still a growing science and there are many unanswered questions? It seems that there is lack of consensus on many thing especially optimal management protocols? What is the reason for this according to you?

PR: Yes, it is improving, and there are many unanswered questions concerning the need for newer targeted treatments for specific tumors that do not have those. I think - generally speaking - that there is general consent on many things, but still over the world there are some disagreements on optimal treatment protocols.

The reason is that in order to answer these questions and fix those disagreements it is absolutely necessary to proceed through multi-centric studies. They are the key to further progress and the only way that could convince researchers and surgeons that sometimes somebody else is right. In fact, genuine and well-organized multi-centric studies first of all rely on the humility to accept that we do not always own the truth.

AS: What are the landmark developments in field of orthopaedic oncology in last 4 decades?

PR: Certainly there are several landmarks in the past progresses in orthopaedic oncology: first of all, having a common language in terms of the Enneking surgery system. Secondly, the newer imaging techniques and neoadjuvant chemotherapy that allow the surgeons to do more and more conservative surgery, while improving patients' survival. Thirdly, the developments in surgical techniques and mainly in the field of prosthetic reconstruction, where the availability of growing prosthesis (with non-invasive systems), the newer materials (such as trabecular metals and nanoparticles), the 3D-Printed custom made prostheses, all contributed to increase the feasibility of complex reconstructions.

Last but not least, the introduction of intra-operative navigation and the current studies to introduce robotics also in musculoskeletal tumour surgery.

AS: You have been the president of ISOLS in 2013. What do you feel is the role of organisations like apmsts or ISOLS in development of orthopaedic oncology?

PR: Yes, I had the pleasure of being president of the ISOLS from 2011 to 2013, and I am also involved as a Board Member or with different commitments in other oncological societies, such as EMSOS, EFORT, SICOT and MSTS. I do think that the role of such Societies is crucial as they can highly contribute to two prominent aspects that are necessary for our progress: education, multi-centric studies and research.

All these oncological Societies take care of educating young doctors by promoting Courses and instituting fellowships, as well as yearly multi-centric studies.

YP: A young boy presents to you and you have a clinical suspicion of bone sarcoma of distal femur. How would you personally approach the diagnosis?

PR: Most of the times, to address such a clinical suspicion is easy, as well as knowing how to proceed in the diagnostic studies and approach. On the contrary, it is much more difficult to properly relate with the patient and his relatives, since our aim is to not scare or waste precious time. The psychological approach and relationship with these people is remarkably important and a doctor involved in oncology should never lose his balance and humanity, which is not always simple

YP: Your major interest has been prosthetic replacement in cases of bone tumors. You are a witness to origin and development of this field from its very early days. Please share with us something about how you saw this field grow and how new principles were added and refined?

PR: When I started to be involved (thanks to Prof. Campanacci) in the field of prosthetic replacement for bone tumors, it was in the early 80's (when the first KMFTR prosthesis was implanted at Rizzoli Institute it

was December 1982). Since then, when Prof. Campanacci joined Prof. Kotz in the development of the design of his modular prosthesis, I have always been involved and had the chance of learning and contributing. In these four decades, I really could see this field growing, as I partly mentioned most specifically concerning stem fixation, newer materials and designs, and growing prostheses. I have also had the opportunity to contribute with my ideas as a consultant or a designer of different prosthetic systems.

AS: What are your views on computer navigation and its role in orthopaedic oncology?

PR: In my experience, especially the newer techniques of design and manufacturing, such as more recently 3D-Printed technology for prostheses of pelvis and spine, have had a considerable impact. Computer navigation has also crucially contributed to refining both resection procedures and reconstruction in orthopaedic oncology, since it is able to address the more precise surgery for pelvic and spinal tumors. When combined with surgeon expertise it may lead to very good results. It will be further implemented in the immediate future by the introduction of software and devices of robotics surgery in oncology.

AS: There are numerous technological tools which are being used in orthopaedic oncology – navigation, robotics and patient specific cutting jigs. What is your opinion on these?

PR: I do believe that all these technology tools are useful and sometimes necessary. In addition, specific cutting jigs combined with custom-made prostheses and nowadays more often 3D-Printed custom made prostheses allow for a more precise pelvic tumor surgery or are useful in partial resections of the long bones or flat bones (e.g. scapula). I have been using these more frequently lately finding them extremely helpful.

AS: What more you expect the technology to do? I mean what you feel the technology will offer the orthopaedic oncology surgeons in future?

PR: I am confident that technology will help to sharpen prosthetic design, and will definitely help our surgery with the introduction of robotics.

AS: What would be the game changers in field of orthopaedic oncology in next 10 years?

PR: And these two above mentioned I expect to be the game changers in the field of orthopaedic oncology in next future years.

YP: Megaprosthesis have been around for more than 30 years now? What are the areas where more research is needed to improve the outcomes and survivorship in megaprosthesis?

PR: The areas, where more research is needed to enhance the outcomes of mega-prostheses, are those of pelvic reconstruction and growing prostheses: we have to address our common efforts and studies in these directions.

YP: Bone metastasis is another area of interest to you? You have been part of Italian Orthopaedic Society bone metastasis study group. What according to you the correct way to approach bone metastasis both therapeutic and palliative? A lot has unfolded in pathobiology of metastasis, what according to you will greatly impact the life of patients with bone metastasis?

PR: Already now, patients with bone metastasis have a much better survival than in the past. And this clearly impacts on the need of longer lasting implants for these patients. The more we understand about pathobiology of metastasis, the better we can treat them systemically.

Certainly, the road is towards targeted therapies or more aggressive therapies that can be nonetheless tolerated by elder patients. We already record a significant increasing of the role of resections and reconstructions, also for metastatic patients.

YP: What should be the main areas of focus for orthopaedic oncology currently

PR:

9) As said before, the key to win is not to use only the knife, but also to find new pathways for systemic treatments and targeted therapies: this would increase the tolerability from the patients, reduce toxicity and, hopefully, improve prognosis.

This is presently explored particularly in the field of soft tissue sarcomas, whereas we are a little be "stuck" for bone sarcomas. Chondrosarcomas Grade III need

medical treatment to be found, since they have the same prognosis than 30 years ago.

New advanced form of radiotherapy, such as carbon-ion and proton therapy, have been playing an increasing role, as well as new techniques of non-invasive treatments, such as FUS, are being used.

YP: You have developed many new surgical techniques. Can you enlist some for us (he has techniques on sacral lesion excision)

PR: Actually, I must be humble and say that I did not introduce any new surgical technique. I only tried to improve or "personalize" some of the existing, something that every surgeon (as every music player or singer) does during his activity. The modified Osaka surgical technique for sacral tumors is an example.

AS: What you feel about outcome scoring in orthopaedic oncology? What is the best way to measure the effectiveness of our treatment? Does conventional survival analysis good for orthopaedic oncology or we need different tools?

PR: This is a tricky field since no one of the current scales for scoring outcomes is absolutely perfect. The most widely used MSTS System, also adopted by ISOLS, needs certainly to be refined.

The best thing to do now is to use more than one of these systems, and also keeping in mind that most of them are sufficient when used to assess the outcomes of patients with the same surgical procedures, but show defects when used to compare different procedures. We have been trying with ISOLS and MSTS to reconsider and refine this functional scoring system.

AS: How do you see the management of orthopaedic oncology changing and evolving in the future say 20 years from now?

PR: It is difficult to predict: there is the hope to achieve major improvements, but the disappointing shade that we will not win! It is hard to bet on: surely, we need to work hard..

AS: Orthopaedic Research. How it has changed and where it should proceed?

PR: Orthopaedic research has remarkably changed since all of us has understood that a team approach is mandatory, also in research as advocated by Prof Campanacci: basic research is the backbone of any progress

AS: Any suggestion for countries like India for research

PR: I do not have, my friend, anything to suggest India: this is a really growing country in all senses. I had the pleasure of meeting several fellows from India and I know from them that you have been doing a superb work. The increase of collaboration between tumor centers among India, and between these ones and other international centers is certainly a clue of progress

YP: Any suggestions for JBST?

PR: JBST is very promising, and I am pleased and honoured to be involved. I do think that dedicating - as you have been doing - more and more attention to educating young doctors into the expanding field of the orthopaedic oncology will be successful.

YP: You are very popular among your patients, any particular tips on interacting with your patients?

PR: Actually, I do not know if I am, but to be yourself and interacting genuinely with them is the keyword. It is sometimes difficult to find a balance between being friends and feeling involved and helping them in finding the strength to face the trouble they have to. Doctors need to be constantly available ("Never be unreachable" is one of my rules that I try to transmit to my pupils), while not taking their place in all decisions and respecting their points of view is of paramount relevance.

AS: You have been a part of many Orthopaedic organisation over a long period of time. Your views on them in general?

PR: As I already mentioned above, I have been involved in many orthopaedic organisations and Societies, and I fully trust in their usefulness and importance, especially for education and research. Moreover, I feel that when we get older and more experienced, we should really try to transfer also through these Societies and organizations our experiences to others. Thus, I have been trying to dedicate more of my time to this, while relying more and more on what my pupils and co-workers can practically do in my place at hospital.

AS: What you feel is the 'Way of Working' or 'Mantra' of Dr Ruggieri that makes him a successful Orthopaedic Surgeon?

PR: I do not know if that makes me successful, l but it certainly makes me peaceful with myself: I do believe

that what we give to others is what we get back during our lives and further. So this is my philosophy.

YP: Any word of advice for the coming generations of Orthopaedic Surgeons? How should they balance the intellectual, emotional and financial aspect of being an orthopaedic surgeon?

PR: My best piece of advice for young orthopaedic surgeons is: Study as much as you can and work passionately. My mentor, Frank Sim, always taught his fellows that: "Motivation is the key". If we work hard and instil passion in our work, we will do better, possibly feel better and get better results.

YP: I understand that you are a very positive person, but do you have any regrets, specifically related to orthopaedics. Something that you wished to do but couldn't?

PR: Originally, I wanted to be a heart surgeon and in my next life I will do that! Concerning orthopaedics, I have done one tenth of what I wanted to. And there are many things that I still will try to accomplish before the end comes. But to tell this with Ferdinando Pessoa, we have: "...the certainty that we will be interrupted before ending".

AS: What are you other hobbies?

PR: To tell you the truth (and I think I was wrong in this) over the years I have shortened my time to hobbies, both for being lazy and devoting more and more time to my job. I used to play tennis, swimming and travel, all things that I basically stopped doing with the exception of travelling. Most of it is for work (meeting and invitations), but I still have the pleasure of travelling with my family whenever I can.

AS: What do you like to read?

PR: I like reading many different types of books. Unfortunately, my trend has turned from more cultured philosophic books to some readings that can help me to wind down and take a break. I still like poetry, and also listening to music.

AS: Any particular philosophies that impressed you over your life? What is your current philosophy of life?

PR: I am Catholic and, apart from the faith, I am persuaded that the Christian humanism, that we theologically have in ourselves, has a positive impact on our lives. Thus, this is my current philosophy of life, similar to what stated in my answer 43: "The more you give to people and life, the more you get for your soul and human being".

AS: You have been travelling and teaching for a very long time. How do you cope with the hectic schedule?

PR: Yes, I have been travelling quite a lot for job, and it has become increasingly demanding. I always tell myself that I am going to reduce or quit, but I do not think I am going to do it right now!

YP: What more you will like to achieve/ do in the field of orthopaedic surgery in years to come?

PR: Certainly, I would like to contribute a little bit more to our field. More than other aspects, I am especially interested in reconstructive surgery and pelvic tumor surgery. However, I know for sure that something that I care with passion is to try to instill my experience to my pupils and fellows, supporting them as much as I can.

YP: Any aspect of Dr Ruggieri, that we are unaware of?

PR: Probably, there are many and some that even Prof. Ruggieri does not know, but - my dear friend Yogesh - unfortunately, I not going to tell you them this afternoon!

Conflict ofInterest: NIL
Source of Suppot: NIL

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