2017 Overseas Elective Program Report

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The Keck School of Medicine of the University of Southern California (USC), founded in 1885, is the oldest medical school in Southern California. The institution teaches and trains healthcare professionals including physicians, nurses, and biomedical scientists, conducts medical research, and treats patients. My 4-week-long clerkship took place in the Los Angeles County+USC Medical Center, which is a 600-bed public teaching hospital jointly owned and operated by the Los Angeles County Department of Health Services and USC. It is the largest single provider of healthcare in Los Angeles County and also one of the largest public hospitals and medical training centers in the United States. Each year, LAC+USC has almost 39,000 inpatients discharged, 1,000,000 ambulatory care patient visits, and over 150,000 emergency patient visits. It operates 1 out of only 3 burn centers in the entire Los Angeles County and one of the few Level III Neonatal Intensive Care Units in Southern California.

LAC+USC provides a full spectrum of emergency, inpatient, and outpatient services in medicine, surgery, emergency/trauma, obstetrics, gynecology, pediatrics, and psychiatry. It offers healthcare for the medically underserved population in the area and treats more than 28% of the local trauma victims. LAC+USC also provides services for half of all AIDS and sickle-cell anemia patients in Southern California. Many of the doctors are Keck faculty members, and more than 1,000 residents in training provide medical service.

While working with the Medical Oncology Consults Team at LAC+USC, I cooperated with 1 attending, 1 fellow, and 3 residents (1 PGY-2, 2 PGY-1) to provide

service for an average of 10-15 patients per week. Each day started at around 8:00am with patient interviews and examinations followed by rounds at 10:00am. After roughly 2 hours of reviewing each patient's case in much detail, the whole team visited all the newly admitted patients. In the afternoons, the attending held didactic sessions consisting of lectures about colon, lung, breast, pancreas, ovarian, testicular, and bladder cancer and relevant practice problems approached in "Jeopardy!" style. GI and GU Tumor Boards were held every Wednesday, where medical practitionists from various departments congregated to discuss patient cases requiring special attention. Jail Clinic took place every Friday morning, where jail patients were brought into a segregated section in the basement of the hospital so that they may receive outpatient care or chemotherapy infusions.

As a medical student, I was assigned roughly 2 patients at a time to continuously follow throughout their admissions. A particularly interesting case involved a 21-year-old Chinese female with metachronous myxofibrosarcoma and osteosarcoma. The patient had a history of right mandible myxofibrosarcoma treated with surgical resection followed by radiation of 5800 cGy x 29 cycles in 2015. She also had a history of benign right ovarian teratoma treated with resection in 06/2016. The patient was recently diagnosed with osteosarcoma involving the T-spine and received T10-T12 laminectomy and partial corpectomy on 05/24/2017. She was readmitted 06/26/2017-07/08/2017 for worsening back and bilateral thigh pain, and her MRI (06/26/2017) showed increase in tumor size with circumferential encasement of the spinal cord at T10-T11 and increased extension into the neural foramina on the left in addition to increased mass effect. She subsequently underwent surgical decompression of T9-L2, laminectomy of T9, debulking of neural foramina, and partial laminectomy of T8 on 06/29/2017. Post-op MRI revealed significant decompression with some persistent tumor at T11 with mild mass effect on the thecal sac and decreased circumferential encasement at T11-T12. Repeated MRI (07/01/2017) demonstrated significant decompression of the disease, though noted some persistent tumor at T11 with mild mass effect on the thecal sac in addition to decreased circumferential encasement from T11-T12.

The patient's case was discussed at sarcoma tumor board on 06/30/2017 and chemotherapy with Adriamycin/Cisplatin was recommended. The patient presented to

oncology clinic on 07/12/2017 and was scheduled for inpatient Adriamycin/Cisplatin on 08/01/2017. However, the patient presented to the emergency department on 07/19/2017 with bilateral leg pain and weakness as well as chest heaviness. Her MRI showed interval progression at the T12 body and new evidence of epidural extension of the disease at T2-L2 with severe spinal cord compression at T8-T12. The patient was transferred to neurosurgery for urgent decompression and medical oncology was consulted for post-op chemotherapeutic intervention/treatment.

The patient received her first cycle of chemotherapy 07/24/2017-07/26/2017. During her admission, she was proven negative for Li-Fraumeni syndrome. Her CT showed metastatic disease with lung involvement as well as bilateral pulmonary emboli and renal vein thrombus; thus, she was prescribed with a therapeutic dose of Lovenox (Enoxaparin). Her TTE documented an EF of 47%, although her MUGA revealed an EF of 71%. The patient endured chemotherapy with minimal complications and was planned to continue her regimen every 21 days.

Although synchronous or metachronous tumors is not uncommon, especially in genetic disorders such as Li-Fraumeni and Rothmund-Thomson syndrome, the occurrence of two histologically different sarcomas in a single patient is extremely unusual. Despite the fact that myxofibrosarcoma is one of the most common soft tissue sarcomas in adults and osteosarcoma is the most common primary malignant bone tumor, the development of osteosarcoma secondary to myxofibrosarcoma is very rare. Only a few well-described examples of histologically distinct synchronous or metachronous soft tissue sarcomas have been reported in literature. There are several possible explanations for the occurrence of synchronous or metachronous sarcomas, including genetic predisposition, impaired immune status, or previous exposure to mutagenic therapies such as chemotherapy or radiotherapy. It is important to understand the critical role of biopsy followed by careful histopathological evaluation in distinguishing between synchronous or metachronous neoplasia and metastatic tumor.

Meanwhile, another interesting case involved a 62-year-old Hispanic male who presented with massive ascites post-Gemcitabine treatment. The patient had a history of pancreatic head adenocarcinoma accompanied by biliary and pancreatic duct dilatation, which was treated with Whipple’s operation in 02/2017. His

pathological stage was confirmed to be pT3N1 stage IIb. Following surgery, the patient received 3 cycles of adjuvant chemotherapy with Gemcitabine + Xeloda (Capicitabine), which he endured well. He had an embolic stroke in 04/2017.

The patient was most recently admitted to the hospital with complaints of increasing general weakness over the past 2 weeks as well as abdominal pain, abdominal distention, and bilateral lower extremity edema. Neurology ordered a brain MRI and MRA, which revealed no acute events of CVA, and medical oncology was consulted for further management. Upon physical examination, the patient presented with significant abdominal distention involving ascites. His abdominal CT revealed ascites as well as a number of enhanced lesions in the peritoneum and pancreas, which radiology noted may or may not be indicative of malignancy, thus recommending pathologic confirmation. His chest CT showed pleural effusion and pericardial effusion. Profound pitting edema in his bilateral lower extremities was observed, and his lab results gave an albumin of 2.0. To assess the cause of his ascites, a urinalysis, TTE, and paracentesis with cytology were ordered. His urinalysis was normal with no evidence of nephrotic syndrome. His first TTE revealed a decrease in systolic movement, though his second TTE gave normal results. His paracentesis revealed SAAG > 1.1 and cytology revealed malignant cells.

Drawing from these facts, the cause of the patient's ascites was attributed to recurrence of pancreatic cancer with malignant effusion. However, the noticeably large amount of ascites as well as pleural effusion, pericardial effusion, and profound lower extremity edema altogether suggested a high possibility of additional causes other than recurrent malignancy. One probability was systemic capillary leak syndrome triggered by Gemcitabine. Systemic capillary leak syndrome is characterized by rapidly developing edema caused by sudden, reversible capillary hyperpermeability with a rapid extravasation of plasma from intravascular to interstitial space, and a few case reports have shown that Gemcitabine can result in this syndrome. It is not certain that Gemcitabine led to capillary leak syndrome in this particular patient, resulting in massive ascites, pleural effusion, and pericardial effusion, but there is a chance it may have exerted some influence on his disease.

Encountering such cases of rare clinical presentations was a valuable learning experience for me, and I appreciated the many opportunities of bedside teaching.

Because I played an active role in providing service for each patient, I was motivated to search for literature-based evidence regarding diagnostic and therapeutic regimens, which was much more interesting and memorable than simply reading from a textbook. What was most impressive was the willingness of the attending, fellow, and senior resident to take huge amounts of time out of their schedules to teach the interns and medical students. They were always eager to highlight teaching points per patient and offered interactive didactic sessions on a daily basis regarding topics most relevant to patient cases discussed on that very day. On the other hand, I was treated no differently from a resident when giving oral presentations regarding daily progress of patients and was able to freely discuss assessments and plans with the rest of the team. These discussions carried on to family meetings and tumor boards, where everyone was given the opportunity to pose questions, share expertise, or offer new ideas. The fact that a Medical Oncology Consults Team was set apart from the primary team designated entirely for consults was very new to me, though the unique system definitely allowed for plenty of specialization and collaboration with not only the primary team but also the palliative care team, social services team, etc. Meanwhile, because the patient population was 80% Hispanic and many of them could only speak Spanish, there did exist some language barriers despite 24/7 access to phone interpreters. These limitations allowed for me to realize that if I were to practice in Southern California, I would have to polish my Spanish speaking skills.

It was no surprise that the patient-physician ratio was much lower at LAC+USC than SNUH. While the Medical Oncology Consults Team provided service for approximately 10-15 patients and primary teams oversaw roughly 20 patients in the ward, SNUH service teams would treat nearly 50 patients at a time. The difference was less about the numbers; it was more noticeable in the amount of attention and care the physicians were able to provide for each patient and thus the trust and intimacy established between physician and patient. Because everything was much slower-paced, it did seem as though less work was getting done, though the physicians, patients, and their families tended to be much more at ease and satisfied with their current status. Moreover, while the residents expressed plenty of respect and formality toward the attending and fellow, this did not signify any sort of a strict hierarchy but rather allowed for everyone to stand on the same ground. Such an ambience created an open space for members to freely ask provocative questions

and share creative thoughts. It would be helpful to incorporate such work ethics at SNUH as much as they were proven to be effective at LAC+USC.