**Patient History**

A 71-year-old male presented to a local VA clinic as a walk-in patient complaining of scrotal edema and intermittent, non-radiating left testicular pain for a duration of approximately one month. The patient's history is significant for a 15-year history of smoking and asbestos exposure in 1972. At the time of examination the patient complained of pain in the groin area, but denied specific testicular pain. The patient was diagnosed with a hernia and was referred to urology for consultation and ultrasound. The scrotal ultrasound was significant for a 5.9 x 4.2 cm hydrocele, but no intratesticular masses. The patient underwent a left hydrocelectomy and during dissection of the hydrocele, multiple firm nodules were noted on the tunica vaginalis, epididymis, and tunica albuginea. Due to the concern for malignancy and the unavailability of frozen section services at the clinic, an orchiectomy was performed with consent of the patient's spouse. Approximately two weeks post-op, the patient had a CT scan which revealed left external iliac adenopathy. Two weeks later, a PET scan showed a metabolically active, enlarged iliac lymph node compatible with metastasis. The patient is scheduled for a laparoscopic biopsy of the lymph node later this month.

**Diagnosis**

The specimen was placed in formalin and shipped to the VA Medical Center for gross and microscopic examination. The orchiectomy specimen weighed 42 grams and measured 6.3 x 4.0 x 3.5 cm, with 2.8 cm of attached spermatic cord. The vas deferens was partially absent, which was consistent with a previous vasectomy. The tunica vaginalis was thickened and displayed multiple firm, tan nodules measuring 0.2 cm to 1.5 cm, in greatest dimension (Figure 1). A single nodule was also present on the tunica albuginea (Figure 2); however, the nodules did not involve the testicular parenchyma or the spermatic cord. The nodules displayed a solid, homogeneous, tan cut surface. Histologic evaluation was highly suggestive of mesothelioma, pending immunohistochemistry stains. Immunostains were positive for calretinin, mesothelin, pan cytokeratin, and CK7, and negative for Oct 3/4, CD30, and CEA, which confirmed the initial diagnosis of malignant mesothelioma. (Immunostain D2-40 was noncontributory.)

**Discussion**

Malignant mesothelioma of the tunica vaginalis (also known as testicular mesothelioma) is an extremely rare and aggressive form of mesothelioma, representing less than 1%
The **Cutting Edge** is a quarterly journal published by the American Association of Pathologists’ Assistants

**Editor-in-Chief**  
Dennis Strenk

**Assistant Editor**  
Beth Felicelli

**Book Review**  
Chet Sloski

**CE Quiz**  
Caryn Cooper

**Gross Photo Tutorial**  
Michelle Proctor Johnson

**Tips & Tricks**  
Bill Ahlfeld

### AAPA Committee Chairs

**Administration**
- *Vice Chair*: Lindsay McCarley
- *Vice Chair*: Karen Ron

**Conference**
- *Vice Chair*: Heather Manternach
- *Vice Chair*: Janelle Fabian
- *Exhibitor Recruitment*: Seth Risner
- *Food & Beverage*: Mollie Patton
- *Fun Run*: Lisa Ware
- *Golf*: Larry Marquis

**Education**
- *Vice Chair*: Beth Obertino-Norwood
- *Beyond the Bench*: Jennifer Perez
- *CE*: April Reineke
- *CE Quiz*: Kathy Washington
- *Poster Display*: Caryn Cooper
- *Scholarship*: Jennifer Davidson
- *Speaker Recruitment*: Quintina Herrera
- *Study Materials*: Edgar Severe
- *Study Materials*: Skip Winters
- *Study Materials*: Allie Clayes

**Information & Technology**
- *Vice Chair*: Ryan Schniederjan
- *Social Media*: Lara Goldberg
- *New Members/Students*: Steve Suvalsky

**Membership**
- *Vice Chair*: Roseann Vitale
- *Vice Chair*: Leslieann Gilbert
- *Membership Survey*: OPEN
- *New Members/Students*: Tara Shea-Leandro

**Public Relations**
- *Vice Chair*: Charlene Gettings
- *Social Media*: Joel Wichmann
- *Hollis Notgrass*

**Publications**
- *Vice Chair*: Dennis Strenk
- *Vice Chair*: Beth Felicelli
Letter from the Editor

Dennis Strenk
Editor-in-Chief
journal@pathassist.org

In this issue we present a recap of the annual fall conference, which was held in Toronto this year. This recap begins on page 16 with a summary by Conference Committee Chair, Heather Manternach. We have included pictures from many of the activities during the week, including the lectures, workshops, and the welcome party. Also, there are a few from the poster session, which had a new format this year, allowing attendees to earn additional CE credits. The conference recap is always my favorite part of the fourth quarter journal issue. If you have never been to the annual conference, and you have the means to do so, I would highly recommend you try it.

During the Toronto conference I was honored, and surprised, to receive the Board of Trustees Award. I can’t express how much I appreciate this recognition, but at the same time it’s important to mention that these things don’t happen because of just one person. It is a team effort. With that in mind, the featured committee on page 5 is one part of that team: The Publications Committee. I would like to thank them all for their hard work and dedication.

Many PAs are involved with organizations that are outside of the AAPA, but are related or influential to our field. On page 6 we feature a group of these PAs, who are involved with NAACLs. Hopefully reading about their experiences will inspire more of us to get involved in similar ways.

The member spotlight this time is Chevanne Scordinsky. This continues to be a fun feature. It’s interesting how different the answers have been thus far. We plan to continue this feature into the coming year. Speaking of next year, we also have one or two new ideas which may find their way into the journal.
of all malignant mesotheliomas. Since documentation of the first case in 1957, only approximately 100 cases have been reported in the literature. (1,2,3) Because so few individuals have been diagnosed with the disease, characteristics and symptoms are vague and diagnosis is extremely difficult. An incorrect initial diagnosis, such as a hernia, is common and correct diagnosis can only be made intra-operatively or post-operatively after pathologic evaluation. The most common symptom is a hydrocele.  

Research of testicular mesothelioma is limited; however, it is generally accepted that this type of mesothelioma originates in either the mesothelium-lined tunica vaginalis or on the serosal surface of the tunica vaginalis. On the serosal surface, firm tan-yellow nodules can encase the scrotum and cause thickening of the tunica vaginalis due to the uncontrolled growth of the abnormal cells leading to tumor formation.

Gross examination of testicular mesotheliomas reveal tumor nodules situated on the thickened tunica vaginalis but rarely involving the testicular parenchyma.  

Microscopically, the tumor is characterized by epithelial cells arising from the tunica vaginalis with papillary, tubulopapillary, or solid architectural patterns (Figures 3, 4). Immunohistochemically, the tumor is usually positive for mesothelial markers calretinin, Wilms tumor-1, epithelial membrane antigen, D2-40, thrombomodulin, cytokeratin 7, and cytokeratin 5/6.  

Differential diagnoses include epididymitis, mesothelial hyperplasia, adenomatoid tumor, carcinoma of the rete testis, serous papillary tumor, testicular germ cell tumors (seminomas, embryonal carcinomas, and intratubular germ cell tumors), and pleomorphic sarcomas.  

Although the etiology and pathogenesis of mesothelioma of the tunica vaginalis is unknown, it is acknowledged as an aggressive tumor with high recurrence and mortality rate. Approximately 52% of patients develop local recurrence or metastasis and 40% of patients die from the disease, with a median survival of 24 months.  

Younger patients (under age 60) with non-metastatic cancer have a better prognosis. Treatment includes partial or total orchietomy followed by radiation and chemotherapy and even with surgical removal of the cancer, recurrence is likely.  

Peer Review Notes:  
Received June 2015, reviewed July 2015 and accepted for publication August 2015

Figure 3: Low-power microscopic view of the tumor.

Figure 4: High-power microscopic view of the tumor.

Testicular mesothelioma typically occurs in Caucasian men over the age of 50, especially those who have worked in an industrial or construction industry; however, unlike typical mesotheliomas, testicular mesothelioma has been known to occur in patients with no history of asbestos exposure.  

Smokers with past asbestos exposure are at an increased risk. Other risk factors may include long-term hydrocele, herniorrhaphy, and trauma.  

References


2. Chekol SS, Sun CC. Malignant mesothelioma of the tunica vaginalis: a malignancy associated with recurrent hydrocele, herniorrhaphy, and trauma.  


Meet the Committee

Publications Committee

Dennis Strenk, Chair
I joined the committee in 2007 because I had an interest in writing. When Tisa Lawless, the previous editor, stepped down, I volunteered for the job. When I’m not obsessing over grammar, I like to spend time with my wife, run ridiculous distances, and make ill-advised bets with Beth Felicelli on various sports. I live in Milwaukee, WI.

Beth Felicelli, Vice Chair
I live in Holland, MI, and have been part of the committee for a whole four months. I got involved because I feel a duty to give back to an organization that has helped our profession so substantially. My newest hobby is rock climbing. In my spare time, I go to MSU football/basketball games and win bets against Dennis when MSU plays Wisconsin.

Chet Sloski
I graduated without honors from Quinnipiac in 1993. To the best of my recollection, I have been the book reviewer for the newsletter and journal for the past 14 years. When then-editor Tisa Lawless approached me about reviewing books, I thought that since I enjoyed reading books I might as well get paid for it. When I found out I wouldn’t be getting paid, it was too late. When I can, I enjoy attending the annual conference to see old and new friends, and I especially look forward to the Fun Run which is the only day of the year that I get up at 7am on a Sunday for an invigorating run, followed by a donut and a can of beer.

Alice Levin
I currently live with my husband in Littleton, CO. I became involved with the Publications Committee approximately two years ago. The first installment of Beyond the Bench, featuring educational materials written by colleagues, motivated me to go beyond grossing and represented an opportunity to utilize my writing and editorial skills for the PA community. In my limited spare time I enjoy teaching rifle marksmanship and American heritage with Project Appleseed.

Bill Ahlfeld
I began coordinating the Tips and Tricks column in 2009 after a request from the old Yahoo chat group for a central place for many of the technique-type discussions on the website. I assumed the column hoping that I would often be just coordinating the tips arriving from many different members. Although this has often been the case, I am always looking for additional support and ideas as I begin to run out of my own ideas for topics. In addition to the Publications Committee, I am in my second term on the Board of Trustees and also serve on the Grossing Guideline. I live in Berks County, PA, having grown up fairly locally as well. In my ‘free’ time I enjoy water sports/boating, camping, scuba diving, and most things that get me outdoors. I also ALWAYS have some home renovation project going on.

Lucas Hough
I graduated from the WVU PA program in 2012 and currently live in Charlotte, NC working for Carolinas Pathology Group. I have been a part of the Publications Committee for one year, and reached out to join the committee because I have always had a love of the English language, grammar, and editing. It is rewarding to be able to combine editing with pathology to ensure that every article submitted flows concisely, and has thorough, complete, and appropriate information that pertains to PAs. I enjoy being a part of the AAPA in a capacity that allows me to enhance the association’s publications by reading and reviewing student and peer articles that are submitted for publication and for competitions. I have a 3-year-old corgi named Lola, and I spend a lot of my free time discovering new indie music artists, reading, hiking, skiing, playing tennis (read: running around a tennis court pretending like I know what I’m doing), drinking coffee, and searching for the area of the world I want to travel to next.

Minda Koval-Watson
I joined the committee because I have always had a love of the English language, grammar, and editing. It is rewarding to be able to combine editing with pathology to ensure that every article submitted flows concisely, and has thorough, complete, and appropriate information that pertains to PAs. I enjoy being a part of the AAPA in a capacity that allows me to enhance the association’s publications by reading and reviewing student and peer articles that are submitted for publication and for competitions. I have a 3-year-old corgi named Lola, and I spend a lot of my free time discovering new indie music artists, reading, hiking, skiing, playing tennis (read: running around a tennis court pretending like I know what I’m doing), drinking coffee, and searching for the area of the world I want to travel to next.

Bruce Keopp
I live in Sonoma, CA (the wine and dairy capital of CA). I have been a part of the committee for three years and have forty plus years as a PA. Dennis encouraged me to help with The Cutting Edge articles and reviewing student’s conference presentations. Glad to help. Thanks for the honor. My present work is a private autopsy business. Not a better job for an over-the-hill-take-no-prisoners-burned-out-grossing-surgicals PA in the universe! I am currently part of the Drexel Sacramento PA Health Professional program faculty (thanks to Tina Rader and James Moore). Outside of work I am best friend to my wife of 41 years, still a competitive middle distance and trail runner in the Seniors’ Division, writer, musician, and very proud Papa to two athletic and great grandsons. My future plans are to wind down a blessed career a little, with more regularly-extended weekends and less travel. More road trips around the USA, Europe, Far East, or any other continent definitely not a requirement.

Michelle Proctor-Johnson
I joined the committee in 2008. I live in Midlothian, VA. I joined the committee after a conference because I love teaching and I love photography. In my spare time I am a “dance” mom, a baseball mom, and a professional photographer.

Bill Ahlfeld
I began coordinating the Tips and Tricks column in 2009 after a request from the old Yahoo chat group for a central place for many of the technique-type discussions on the website. I assumed the column hoping that I would often be just coordinating the tips arriving from many different members. Although this has often been the case, I am always looking for additional support and ideas as I begin to run out of my own ideas for topics. In addition to the Publications Committee, I am in my second term on the Board of Trustees and also serve on the Grossing Guideline. I live in Berks County, PA, having grown up fairly locally as well. In my ‘free’ time I enjoy water sports/boating, camping, scuba diving, and most things that get me outdoors. I also ALWAYS have some home renovation project going on.

Lucas Hough
I graduated from the WVU PA program in 2012 and currently live in Charlotte, NC working for Carolinas Pathology Group. I have been a part of the Publications Committee for one year, and reached out to join the committee because I have always had a love of the English language, grammar, and editing. It is rewarding to be able to combine editing with pathology to ensure that every article submitted flows concisely, and has thorough, complete, and appropriate information that pertains to PAs. I enjoy being a part of the AAPA in a capacity that allows me to enhance the association’s publications by reading and reviewing student and peer articles that are submitted for publication and for competitions. I have a 3-year-old corgi named Lola, and I spend a lot of my free time discovering new indie music artists, reading, hiking, skiing, playing tennis (read: running around a tennis court pretending like I know what I’m doing), drinking coffee, and searching for the area of the world I want to travel to next.

Minda Koval-Watson
I joined the committee because I have always had a love of the English language, grammar, and editing. It is rewarding to be able to combine editing with pathology to ensure that every article submitted flows concisely, and has thorough, complete, and appropriate information that pertains to PAs. I enjoy being a part of the AAPA in a capacity that allows me to enhance the association’s publications by reading and reviewing student and peer articles that are submitted for publication and for competitions. I have a 3-year-old corgi named Lola, and I spend a lot of my free time discovering new indie music artists, reading, hiking, skiing, playing tennis (read: running around a tennis court pretending like I know what I’m doing), drinking coffee, and searching for the area of the world I want to travel to next.

Bruce Keopp
I live in Sonoma, CA (the wine and dairy capital of CA). I have been a part of the committee for three years and have forty plus years as a PA. Dennis encouraged me to help with The Cutting Edge articles and reviewing student’s conference presentations. Glad to help. Thanks for the honor. My present work is a private autopsy business. Not a better job for an over-the-hill-take-no-prisoners-burned-out-grossing-surgicals PA in the universe! I am currently part of the Drexel Sacramento PA Health Professional program faculty (thanks to Tina Rader and James Moore). Outside of work I am best friend to my wife of 41 years, still a competitive middle distance and trail runner in the Seniors’ Division, writer, musician, and very proud Papa to two athletic and great grandsons. My future plans are to wind down a blessed career a little, with more regularly-extended weekends and less travel. More road trips around the USA, Europe, Far East, or any other continent definitely not a requirement.

Michelle Proctor-Johnson
I joined the committee in 2008. I live in Midlothian, VA. I joined the committee after a conference because I love teaching and I love photography. In my spare time I am a “dance” mom, a baseball mom, and a professional photographer.
We know many of our members volunteer their time and talents to organizations outside of AAPA to improve and advance the PA profession. In this issue, we spoke with several members who are or have been NAACLS volunteers: Cherie Germain, Jim Moore, Colleen O’Hare, Jerry Phipps, and Steve Sulvasky.

What is your current role with NAACLS?

CHERIE: I recently moved into the role of Lead Discipline Person for Path A for 2016. Since 2014 I have been the Lead Educator for Path A.

COLLEEN: I am a paper reviewer and site visitor for HT-HTL and PA programs who are renewing their accreditation.

JERRY: I just finished an eight-year term on NAACLS Board of Advisors. I’ve also served as Chair of the Bylaws Committee, Secretary, Vice President, President-Elect, President, and Past President.

JIM: Member, Board of Directors

How did you become involved with NAACLS?

COLLEEN: Jerry Phipps recruited me when a position became available. I chaired the AAPA Membership Committee and Jerry and I had worked together regarding qualifications for OJT-trained PAs and student membership.

JIM: Invite from AAPA Board of Trustees.

STEVE: I attended a NAACLS seminar in Chicago about what was involved in training program accreditation. Shortly after, the AAPA was invited to become affiliated with NAACLS in a limited capacity.

If any, what previous positions have you held at NAACLS?

COLLEEN: I was a member of the PA Committee when it was separate. When we joined with the other accreditation professions and the Review Committee for Accredited Programs was created, I was co-chair and then chair of the committee.

STEVE: I was a member of the APaRC Subcommittee (later the Pathologists’ Assistants Review Committee); one of two AAPA representatives.

What are some key accomplishments from your time with NAACLS that you are most proud of?

COLLEEN: Being chair of RCAP was an accomplishment. Historically, it had been the CP disciplines who led the committee since they were the majority of committee members. My position and personality helped the clinical disciplines see the unique challenges of the PA and HT-HTL training programs. They needed a voice and I think I helped make that happen.

JERRY: Establishing the original PA Essentials and the PA Accreditation process, establishing the Professional Core Curriculum Courses to eliminate accreditation penalties based on courses outside the control of the PA program, and successfully petitioning for an AAPA seat on the NAACLS Board which eliminated the APRC, and mainstreaming the PA profession with other accredited professions in the new Review Committee for Accredited Programs (RCAP).

STEVE: The future Chair of the NAACLS Board of Directors, Cynthia Wells Ph.D., became an advocate for the PA profession. She came to the AAPA Conference in Tucson to participate in a NAACLS-sponsored seminar eventually leading to NAACLS and AAPA working together toward attainment of accreditation for the PA training programs through NAACLS. This was a tremendous stepping stone as the AAPA had mandated that it was an association founded and maintained for the purpose of education. Another key accomplishment was that because NAACLS was a part of ASCP at that time, the AAPA BOT felt that NAACLS accreditation of the member training programs would lead to the national recognition of PAs and a step toward ASCP certification of PAs.

How did/does your role at NAACLS impact the PA profession?

COLLEEN: These are my future peers/employees. I am strict but reasonable about the need to meet the NAACLS training standards. Programs are up against great odds to keep their programs afloat, but I won’t let that be to the detriment of the students. NAACLS has the interest of the students at its core. I want every program to put out graduates who are well prepared and will promote our profession in a positive light and walk on that job the first day and hit the ground running.

JERRY: Establishing an accreditation process for PA education programs through NAACLS-provided academic legitimacy to PA training and graduates. This provided positive publicity and acceptance in the pathology arena. Having a seat on the NAACLS Board elevated the AAPA to the level of other lab professions and provided instant status in the pathology arena. The seat gave the AAPA a voice in establishing NAACLS accreditation policies and procedures rather than simply abiding by them. The offices and positions I held as a Board member, more than being a great personal honor, brought PAs into the conversation as members of the pathology-related lab professions. Much like PA participation in the ASCP certification process, PA involvement at the upper levels has provided positive exposure to the AAPA and all PAs.

JIM: It provides oversight for the standards of education for PA students and the accreditation of the educational programs. It serves as a liaison to NAACLS for the AAPA BOT.

STEVE: I didn’t have a role – I was just in the right place at the right time. Any impact then and today is a continuum of what each AAPA member as a volunteer has contributed throughout the years providing not only our growth, but what is best for the members and the profession.

What previous positions have you held within AAPA?

CHERIE: I served previously as Vice Chair for the Public Relations Committee.

COLLEEN: I was chair of the Membership Committee and was on the board for a brief period of time.

JERRY: I was appointed Chair of the formative Education Committee developing exams which served as de facto certification exams until ASCP certification in 2005. I was elected Treasurer in 1977 leading to terms on the BOT. In 2006, I moved from a regular BOT member to an Adjunct BOT member as the AAPA representative to NAACLS.

JIM: Chair of Education and Membership committees, President, Vice President, Member and Chairman of the BOT.

STEVE: Education Committee Chair, Legislative Committee Chair, BOT member, NAACLS representative, IT continued on page 20 >
Photography Help

Our first tip comes from Elizabeth Regal. While searching for a way to position her ruler for photography, Elizabeth was frustrated with the options available in the gross room for holding the ruler at the correct height to be in focus for a large specimen. She then stacked up several tissue cassettes, wrapped a piece of tape around them, and made an adjustable ruler holder (photos below). As shown, the ruler can be slid through the cassettes at different levels, depending on the needed height for the specimen being photographed. She has been using this for several years and it cost nearly nothing. The specimen label is attached to the ruler and positioned in the lower right hand corner so the printing on the ruler can’t be seen (or can be easily cropped out).

Membrane Rolls

While attending the recent Toronto conference, I was approached several times by newer members regarding the Tips & Tricks submitted in the past. While we’re examining the possibility and format of putting these tips on the website for access anytime, I will repeat one past tip that was presented several times with different options and appeared to be the most interesting to these new members. The subject of this tip is making placenta membrane rolls. Several options were presented in different issues of the journal. The first suggestion involves using methanol. You will need a lid from a large specimen container (164 oz.) and some methanol. Pour a little methanol in the container lid. Take the membrane section (strip) and float it in the methanol. The methanol will ‘snap fix’ the strip (1-5 minutes) making it easy to work with. Wrap the membrane strip around your forceps making a roll. Pin the roll, remove the forceps, and take your section(s). Continue using the same methanol until it gets bloody. Discard the bloody methanol and repeat the process.

An alternative method I have used as a quick way to get good membrane rolls is to roll the membranes around a wood applicator stick. Before cutting the roll from the placental disc, spray the membranes with cryo-freeze spray. This will hold the roll solid and allow enough time to cut good sections that don’t unravel. They will quickly thaw after being placed in the cassette and your fixative. For those membranes that are slippery due to heavy meconium staining, perform your membrane roll ‘inside out’ with the fetal surface on the outer side of the roll as the maternal surface will adhere better to the applicator stick.
Osteosarcoma of the Distal Femur
by Sydney Cooley
Student Delegate Top Article Winner from Rosalind Franklin University of Medicine and Science

Introduction
Osteosarcoma is a malignant cancer which usually affects individuals in their teens and twenties, with 75% of tumors occurring in individuals under age twenty.¹ It is the most common primary malignant tumor of bone and accounts for 20% of primary bone cancers.¹ Men are more affected than women, with a ratio of 1.6 men to every one woman diagnosed with osteosarcoma.² Bone and joint cancers in general are rare in comparison to other cancer types, and there are only three thousand new cases in the United States every year (0.2% of all new cancers).² Of these, only a fraction are osteosarcomas. In individuals under age 25, there are just an estimated 450 osteosarcoma cases per year.²

The Surveillance, Epidemiology, and End Results Program of the National Cancer Institute determined that about 66.6% of patients with bone and joint cancers survive five years after diagnosis.² These numbers are similar for osteosarcomas, with 60-70% of patients surviving five years, but metastases (specifically pulmonary) occur in one to two out of ten patients. The average five-year survival rate for patients with complications (metastasis, recurrence, or secondary osteosarcoma to a previous condition) is less than 20%.²

Osteosarcomas first present with a painful enlarging mass, typically at the metaphyseal region of long bones of the extremities.¹ The cancerous cells produce osteoid matrix or mineralized bone, and the neoplasms can be visualized on radiographs with both lytic and blastic lesions of bone tissue.³ A feature known as a Codman triangle, a triangular shadow between the periosteum and bone cortex, is indicative of an aggressive bone tumor but does not diagnose osteosarcoma specifically.¹ The triangle occurs when the periosteum lifts away from the bone during tumor expansion.³

Subtypes of osteosarcoma are designated based upon the site of origin (within the bone cortex, medulla, or on the surface), whether or not a pre-existing condition was present before the neoplasm, and on the histologic features of the malignant cells. The most common subtype is "primary, intramedullary, osteoblastic, and high grade".¹

Acquired genetic mutations of tumor suppressors and oncogenes appear in 70% of osteosarcomas.¹ These genetic abnormalities usually appear in well-known genes, including RB, TP53, INK4a, MDM2, and CDK4.¹

Chemotherapeutic agents have had success in osteosarcoma cases. They are generally given preoperatively to reduce the size and aggressiveness of the tumor.³ These drugs, specifically doxorubicin, cisplatin, and methotrexate, improved the 20% five-year survival rate of the 1960s and earlier to the 60% rate of the 1980s through today.³ However, even with improvement in surgical techniques and implants in recent years, we have reached stagnation with our five-year survival due to the lack of new chemotherapy options.³ This case study will introduce a patient who was treated for osteosarcoma, as well as the future of targeted drug therapies and the role of the pathologists’ assistant (PA) in the documentation of treatment effectiveness.

Patient History
The patient is a 19-year-old male who presented with pain in his right distal femur which has been ongoing for the previous month. Pain medication was prescribed initially, but the pain returned upon stopping the medication. The patient denied any history of injury to the area and there was no new pain elsewhere in the body. The pain increases with moving the knee joint, but not with weight bearing. The patient has had no other symptoms like fever, chills, change in appetite, or weight loss. A brief review of the body systems determined there were no other remarkable issues.

Upon examination of the right distal femur and knee joint, a firm and immobile mass was palpated along the lateral aspect of the femur. The area was not tender, did not show warmth or erythema, and strength and range of motion increases with moving the knee joint, but not with weight bearing. The patient has had no other symptoms like fever, chills, change in appetite, or weight loss. A brief review of the body systems determined there were no other remarkable issues.

Upon examination of the right distal femur and knee joint, a firm and immobile mass was palpated along the lateral aspect of the femur. The area was not tender, did not show warmth or erythema, and strength and range of motion were normal. Plain film radiograph displayed a mixed lytic and blastic lesion of the distal femur with a lateral Codman triangle.

Hospital Course
The attending physician determined that the lesion appeared to be an osteosarcoma, and recommended further imaging with an MRI and an open biopsy. The lesion was later diagnosed as a high grade osteosarcoma of the right distal femur.

Chemotherapeutic agents were given to the patient prior to surgical procedures. These drugs included inpatient doxorubicin and cisplatin, and outpatient Neulasta (pegfilgrastim). Antibiotics, antiemetics, laxatives, heartburn relief, and calcium and vitamin D supplements were prescribed for home use. Three weeks after the initial treatment, the patient was administered methotrexate. He received additional chemotherapy one week later, and had continuing hospital encounters until surgery.

A surgical procedure was performed to remove the bone lesion. Eight frozen intraoperative consultation specimens were received, including subcutaneous tissue, synovium, iliobibial band, vastus lateralis margin, anterior and posterior cruciate ligaments, and lateral and medial collateral ligaments. Additionally, medial gastrocnemius and distal marrow margin specimens were submitted. The major specimen was the distal femur resection (see Figure 1).

Figure 1: (distal femur resection): Once bisected, the tumor is revealed to be tan-yellow and ill defined. The protrusion of bone is visible on the right external surface of the specimen.

Diagnosis
Gross appearance of the lesion
The distal femur resection specimen with adjacent soft tissue and skin ellipse contained a 4.8 x 4.3 x 4.3 cm protrusion of bone located on the lateral femur. The protrusion was 3.5 cm from the bone resection margin. After bisecting the specimen, a variegated pink-tan to yellow-tan mass with ill-defined borders was visible, measuring 6.5 x 4.6 x 4.3 cm in size and 2.4 cm from the bone resection margin. The lesion grossly abutted the circumsensory bone/soft tissue junction and was loosely adherent to the soft tissue resection margin. The mass was continuous with the external protrusion. The specimen was mapped out into 23 sections, which were illustrated on a bone diagram. Twenty seven sections were submitted for histologic processing. No lymph nodes were found or submitted for this specimen.

Histologic appearance and diagnosis
No evidence of malignancy was found in the intraoperative consultations, specimen bone margin, or additional tissue submissions. In the tumor, the WHO classification type was determined to be conventional osteosarcoma, chondroblastic, high grade, with 40-50% necrosis (Figure 2, 3). The greatest dimension of the neoplasm was 6.5 cm. The determined distance from the sarcoma to the bone resection margin was 2.4 cm. Treatment effect from chemotherapy was present in the bone tissue.
the patient had no signs of recurrence of the osteosarcoma and reports no pain or hindrance during physical activity.

**Discussion**

This patient received the standard osteosarcoma chemotherapy regimen, which has been essential in increasing the five-year survival rate of patients since its development in the 1980s. These chemotherapies work to cause necrosis of the malignant cells in the tumor and are most successful when given prior to surgery. The effectiveness of the drugs directly correlates with the amount of necrosis in the tumor, but is not consistent for all cases due to variations in the genetic composition of the tumor cells. Recent research has found that high and low expressions of certain microRNAs are linked to metastasis versus positive chemotherapeutic response of osteosarcoma cells.

The percentage of necrosis, and therefore the chemotherapeutic success, is able to be analyzed due to a team effort between the pathologists’ assistant and the pathologist. The pathologists’ assistant, while processing the specimen, creates a bone map of an entire slice through the center of the tumor and uninvolved bone. They first take a picture of the bisected specimen, and then use a saw to shave off a thin slice of the surface area of one half of the cut surface. The PA then blocks out the entire slice into pieces that will fit in the cassettes and draws out the cuts made onto the bone map image. After this, they write the corresponding cassette number for each piece on the image. When the pathologist examines the sections under the microscope, they are able to tell how much necrosis is present on each slide and match it up to the area on the bone map. By summing up all of the necrosis they see in each slide they are able to determine the percentage of necrosis for the entire tumor.

In addition to pro-metastatic miRNA expression, drug resistance to chemotherapy is another hurdle that must be overcome to improve the five-year survival of osteosarcoma patients. Resistance to the typical anticancer agents is associated with the DNA binding protein HMGB1 (high mobility group box 1), as recently determined by researchers. This protein regulates autophagy and could be targeted in future therapies.

With molecular testing of patient specific osteosarcoma components and correlation to the amount of necrosis in the tumor after chemotherapy, targeted drug therapies may become possible for this aggressive cancer. Analysis of MicroRNA and other components within the osteosarcoma cells may inform the physician about the likelihood of chemotherapeutic success or metastasis, but currently targeted treatment is not available due to lack of alternative drugs.

While the patient in this case study had success with the current drug and surgical options, there are many other patients who have encountered metastasis or drug resistance. A lack of pharmaceutical options has caused stagnation in the survival rates of osteosarcoma patients since the 1980s when the 60% five-year survival rate was reached. Although we have greatly improved our surgical techniques in the last 30 years, it is unlikely that we can increase patient survival without new chemotherapies. Emerging research in nanoparticles may become useful for chemotherapy as the particles could encapsulate non-water soluble drugs, such as curcumin, and allow them to be delivered into the cells. This may open up the door for the use of drugs which have shown laboratory success, but are limited by their delivery systems in the human body.

**Conclusion**

Osteosarcomas are tumors of young healthy individuals and have relatively low survival rates, even without complications. Despite improvements in surgical techniques, there has been little advancement in chemotherapy since the 1980s, and survival rates have stagnated. Molecular analysis and nanoparticle technology may breathe new life into drug development for this disease. The effectiveness of chemotherapy can be measured by the percentage of necrosis of the tumor at resection, which is documented on a bone map by the pathologists’ assistant. This data can be gathered and analyzed to gain a better understanding of the disease process and the success of new treatments.

Information for this case was provided by Shedrick McClenton through University of Kansas Medical Center.

**Peer Review Notes:**

Draft article received April 2015 and reviewed May 2015. Final article received July 2015 and accepted for publication August 2015.

**References**


**Histologically,** the formation of bone by the tumor cells is diagnostic of osteosarcoma, and the chondroblastic subtype is declared when malignant cartilage is abundant within the mass. However, the tumor stage is much more important to prognosis and treatment than the histologic grade and category. The AJCC staging of this tumor was determined to be ypT1 pNx pM:Na. This means that the tumor has been downstaged after neoadjuvant chemotherapeutic success, is able to be analyzed due to a team effort between the pathologists’ assistant and the pathologist. The pathologists’ assistant, while processing the specimen, creates a bone map of an entire slice through the center of the tumor and uninvolved bone. They first take a picture of the bisected specimen, and then use a saw to shave off a thin slice of the surface area of one half of the cut surface. The PA then blocks out the entire slice into pieces that will fit in the cassettes and draws out the cuts made onto the bone map image. After this, they write the corresponding cassette number for each piece on the image. When the pathologist examines the sections under the microscope, they are able to tell how much necrosis is present on each slide and match it up to the area on the bone map. By summing up all of the necrosis they see in each slide they are able to determine the percentage of necrosis for the entire tumor.

In addition to pro-metastatic miRNA expression, drug resistance to chemotherapy is another hurdle that must be overcome to improve the five-year survival of osteosarcoma patients. Resistance to the typical anticancer agents is associated with the DNA binding protein HMGB1 (high mobility group box 1), as recently determined by researchers. This protein regulates autophagy and could be targeted in future therapies.

With molecular testing of patient specific osteosarcoma components and correlation to the amount of necrosis in the tumor after chemotherapy, targeted drug therapies may become possible for this aggressive cancer. Analysis of MicroRNA and other components within the osteosarcoma cells may inform the physician about the likelihood of chemotherapeutic success or metastasis, but currently targeted treatment is not available due to lack of alternative drugs.

While the patient in this case study had success with the current drug and surgical options, there are many other patients who have encountered metastasis or drug resistance. A lack of pharmaceutical options has caused stagnation in the survival rates of osteosarcoma patients since the 1980s when the 60% five-year survival rate was reached. Although we have greatly improved our surgical techniques in the last 30 years, it is unlikely that we can increase patient survival without new chemotherapies. Emerging research in nanoparticles may become useful for chemotherapy as the particles could encapsulate non-water soluble drugs, such as curcumin, and allow them to be delivered into the cells. This may open up the door for the use of drugs which have shown laboratory success, but are limited by their delivery systems in the human body.

**Conclusion**

Osteosarcomas are tumors of young healthy individuals and have relatively low survival rates, even without complications. Despite improvements in surgical techniques, there has been little advancement in chemotherapy since the 1980s, and survival rates have stagnated. Molecular analysis and nanoparticle technology may breathe new life into drug development for this disease. The effectiveness of chemotherapy can be measured by the percentage of necrosis of the tumor at resection, which is documented on a bone map by the pathologists’ assistant. This data can be gathered and analyzed to gain a better understanding of the disease process and the success of new treatments.

Information for this case was provided by Shedrick McClenton through University of Kansas Medical Center.

**Peer Review Notes:**

Draft article received April 2015 and reviewed May 2015. Final article received July 2015 and accepted for publication August 2015.

**References**


In 1831, Dr. Thomas Dent Mütter was 20 years old and had just graduated from America’s first School of Medicine, the University of Pennsylvania’s Medical College, which was founded in 1765. His career plan was to travel to Paris, which was then the hub of medical achievement. Hundreds of American doctors trekked to Paris every year aware that to be at the top of your game you had to study in Paris. There were even guidebooks written solely for visiting American doctors. In Paris, you could buy a cadaver for six dollars; in America cadaver dissection was largely illegal, which is to say that one had to pay considerably more than six dollars to procure one.

Unlike some of his colleagues, Mütter was a man of modest means, and once in Paris he planned to learn all he could about modern medicine until his limited funds were drained. Above all, what attracted Mütter to Paris was their surgeons. While in Paris, he would work and study under such surgeons as Guillaume Dupuytren and Philibert Joseph Roux.

Needless to say, surgery before the advent of anesthetics was brutal. Preparation for surgery often consisted of offering the patient a glass of wine to calm the nerves and dull the pain. The patient would be asked one last time if they consented to the surgery. (“Will you have your leg off, or will you not have it off?” is how one surgeon asked. (“Will you have your leg off, or will you not have it off?” is how one surgeon asked.) Once they said yes, there was no turning back. The patient would lie on the surgical table, held down by the surgeon’s assistants, and was told to stay as still as possible. The initial incision would bring the first of many screams. The patient would beg the surgeon to stop, but the surgeon had to ignore it all, as did his assistants. There were times where the patient broke free, jumped off the table and attacked their doctors, sometimes with the surgeon’s own sharp tools.

True, sometimes patients died during surgery or after, on account of bleeding or infection owing to un washed tools. But sometimes they survived and lived better lives. Common operations included excision of tumors of the face and jaw. Operations on internal organs, such as the brain and lungs, were attempted only on accident victims. Of course there were amputations, which were amongst the most gruesome. It is not surprising that speed was sometimes prized over accuracy, and in at least one case an unfortunate man undergoing an AKA lost more than he signed up for.

According to Aptowicz, at this time a new field of surgery was emerging in Paris, which they called, *les operations plastiques*. This radical surgery was performed on people who were referred to as “monsters.” Some of these unfortunate were born with congenital defects, some had developed tumors and others were the victims of trauma. Mütter grasped that these patients were quite different from other patients. Other patients, despite their conditions, when first poked with the surgeon’s knife invariably had second thoughts, and some quickly came to the conclusion that life might not be so bad without the surgery. But not those termed monsters. They were shunned by others as they walked down the street. Extreme pain and even death were risks they were willing to take to make them whole. Plastic surgery offered this hope to them. Mütter took a great interest in plastic surgery and learned all he could under his Parisian masters.

Meanwhile, back in Philadelphia, the state of medicine left much to be desired. Until the 1890s, one did not even need a medical degree to practice medicine in Philadelphia. Doctors did not wash or sterilize their hands or tools. The worry of sepsis was always present. It was expected that wounds would eventually fester with pus, and thus classifications of pus were developed; yellow pus being good “laudable pus.” Bleeding, often with leeches, was a widespread accepted medical practice. Medicines were not standardized, and accidental poisoning was common. The creed, “First do no harm,” was never more apposite. As mentioned, there was no anesthesia. Alcohol stood in for anesthesia, although pure opium was sometimes available.

After he left Paris and returned to Philadelphia, Mütter set up a private practice. The patients, however, were not flooding in. This may have been due, in part, because Mütter did not have a well-connected family like many other physicians. Another reason could be that he talked up the Parisian physicians as superior to American physicians, perhaps brushing potential patients as well as American physicians the wrong way. Frustrated, Mütter was about to bolt Philadelphia and return to Paris, when he was offered a position as an assistant to a Dr. Harris at the summer school of medicine. The Medical Institute in Philadelphia; Mütter would not only be able to practice as a surgeon, he would be a teacher. It was a turning point. For better or worse, Mütter was now part of the turbulent and cutting-edge milieu of Philadelphia’s medical schools.

Despite protestations from the well-heeled and politically-connected gentlemen at the University of Pennsylvania Medical School, Philadelphia would attain its second medical school. In 1824, Jefferson Medical College was founded. Here Mütter would eventually be elected to a chair in surgery, where he would practice medicine as well as teach. At Jefferson, he was able to attempt the kinds of ambitious surgeries he had learned about in Paris, many of which were, “the difficult domain of reparative and
reconstructive surgery.” The key to these surgeries, Mütter knew, was you had to be quick so as to lessen the stress and pain of the patient, but slow enough to make sure you were doing it right. He was also one of the first believers in aftercare, ensuring the work he did as a surgeon would not be complicated later by infection. He was also appalled that right after surgery patients were sent home in a carriage, as there were no recovery rooms. He would, in time, change that at Jefferson.

Mütter’s students warmed to him. Aptowicz tells us that Mütter was the first professor to introduce the Edinburgh “quizzing” system of teaching in America. Traditional lectures were a one-way conversation with students. Mütter’s method was to engage with them. Challenge them. Tactfully point them to the correct line of thinking. Students also liked Mütter because over the years he had amassed a collection of extraordinary material and medical specimens which he would often, to the delight of his students, bring to class. There didn’t seem to be an injury or disease for which he could not produce an appropriate specimen.

True to his progressive nature, Mütter was amongst the first physicians to accept the germ theory of disease. The long-standing miasma theory blamed the cause of many diseases on bad air breathed in. Epidemics were not passed from person to person. Rather, it was broadly assumed that all parties infected had breathed the same poisonous vapor or mist, identified by its foul smell.

Though the idea of diseases being spread by doctors through contaminated tools and unwashed hands would not be widely accepted for four more decades, Mütter and like-minded colleagues seemed to understand the dangers of doctors not keeping their hands, clothing, tools, and surgical areas clean. Unfortunately, many influential physicians disagreed. A colleague at Jefferson, the influential and head of obstetrics Dr. Charles Meigs did not share Mütter’s view on infectious diseases. He wore a single work frock until the end of the day, regardless of how many patients he saw, and no matter how stained it might be. He publically disagreed with those who believed that diseases were spread by doctors, and dismissed the aggressive washing of hands and tools. He did all he could to discredit the germ theory of disease and his opinion appears to have triumphed at Jefferson. The medical school at the University of Pennsylvania was also officially in the “miasma camp.”

Aptowicz tells us that in 1852, 400 Philadelphians died of smallpox, 433 of scarlet fever, 558 of dysentery, and more than 1,200 by tuberculosis. Civic leaders were starting to suspect there was a connection between sanitation and disease, even if the learned physicians at Jefferson and The University of Pennsylvania did not.

Enter Oliver Wendell Holmes, Sr. The 34-year-old published a controversial paper titled, “The Contagiousness of Puerperal Fever.” The idea for the paper came about after he read of a particular case involving puerperal fever. After performing an autopsy on a woman who had died of puerperal fever, the physician died of the same infection less than a week later, apparently because of a wound he received while performing the autopsy. On top of that, before the physician died he served as an obstetrician for several women, all of whom developed puerperal fever. In his paper Holmes argued that the infection was most often transmitted to the patient by attendants: doctors, nurses, or midwives. He advocated techniques for preventing the spread of the disease, including promoting a clean and sterile environment for the birth room, and having the doctor thoroughly wash his hands, arms, face, and tools.

Many at Jefferson and the University of Pennsylvania still were not won over. Dr. Meigs refused to accept the contagious nature of puerperal fever and attacked Holmes. “(I prefer) to attribute these cases to accident, or Providence, of which I cannot form any clear idea.”

Holmes shot back, “If I am wrong, let me be put down by such rebuke as no rash declaimer has received since there has been a public opinion in the medical profession of America. If I am right, let doctrines which lead to professional homicide be no longer taught from the chairs of (Jefferson Medical College and the University of Pennsylvania)...”

Of course we know how this standoff ended. But how many lives were needlessly sacrificed on the altar of the huge ego?

Some of Mütter’s most successful operations involved burn victims, often women. In the 1800s women wore restrictive clothing. Layer upon layer of cotton, wool, and silk clothing held snugly to the body with tightly-bound ribbons and laces. Her movement was, of course, severely limited, and she was expected to do her daily chores; and cooking was done over an open flame. The natural fibers were flammable and accidents invariably happened. The women’s faces were often hideously burned. Very little could be done for these unfortunate women. The scar tissue would grow painfully tight around the women’s faces. Scarring commonly reached from the chest up to her eyes. They frequently could not close their mouths, blink their eyes, or turn their heads. Mütter wanted to change that.

It was known at the time that transplanting a piece of skin—even from the same person—would result in the body’s ultimately rejecting it. However, the French doctors popularizing plastic surgery in Paris introduced Mütter to a revolutionary concept. They realized that if one section of a patient’s skin remained attached to the body, and that skin was simply twisted over an open wound, it had a higher probability of attaching, slowly grafting itself onto the new area and becoming healthy. Mütter tried this on his burn victims. The surgery would one day carry his name; the Mütter flap.

In the second half of the 19th century, the pre-anesthesia days of surgery were numbered. But, like everything else, it would not be easy. The ameliorating effects of nitrous oxide were discovered by Humphry Davy of England. He was impressed with nitrous oxide’s ability to stop the body from feeling pain, but never thought to advertise it as an anesthetic for surgery. Instead, he promoted it as a cure for hangovers. He even performed experiments on himself to see how many bottles of wine he could drink in a night and still have the effects erased. In the 1830s and 1840s, it was not uncommon for a showman to set up shop in towns throughout the United States showcasing these amazing gases.

In 1844 the dentist Horace Wells grasped the potential of sulphuric ether and nitrous oxide. He had a colleague extract one of his teeth after inhaling some of it. Wells said, “It is the greatest discovery ever made! I didn’t feel as much as the prick of a pin!” In
1846, John Collins and William T.G. Morton gave the first-ever public demonstration of the effects of sulphuric acid mixed with air. At Harvard they used it before removing a small tumor from the neck of a patient. When the patient woke up, he felt no pain. It was not long before surgeons used it on amputations with great success.

Mütter was all for using this new discovery, and would be the first surgeon in Philadelphia to administer ether anesthesia. But there were naysayers, especially in Philadelphia. Some of their reasons were valid, some less so. First, there were a number of deaths. This could plausibly be attributed to lack of standardization of the anesthesia; you could not rely on the quality or consistency of the sulphuric ether. The correct dosage was a guessing game, not an exact science. And on top of that, the use of chloroform as an anesthetic was introduced in 1847, which was even trickier to administer and led to more deaths, tarnishing the successes of sulphuric ether anesthesia by association.

A second valid reason was that surgery was traditionally performed on a conscious patient, one who was able to communicate and express pain to his or her surgeon. Removing this element from the act of surgery seemed dangerous and unnatural to some. A third plausible—although wrong—reason was that some physicians believed that using anesthesia hampered the body’s ability to heal and recover after surgery.

One reason that was definitely not valid was that some physicians believed suffering and pain were necessary and part of God’s plan. This was a particular argument when debating the use of anesthesia for women undergoing childbirth. Was the pain of childbirth not the price paid for original sin? Many physicians thought so, all of whom were, of course, men.

In time anesthesia would, of course, become widely accepted. One can imagine anesthesia’s most vehement critics becoming converts on the eve of their own surgeries.

Now getting on in age, Mütter was suffering from lung ailments, which Aptowicz tells us may have been partly due to his inhaling chemicals in the surgical room. It got to the point where he was coughing up blood. He also suffered from flare ups of gout which limited his surgeries. In 1856 he resigned from his surgery chair at the Jefferson Medical College after serving 16 years. Sensing his time was short, he still had one important task: to find a home for his extensive collection of unusual medical specimens. These specimens included: osseous, nervous, vascular, muscular, and other preparations for anatomical demonstration. There was also a large number of wet preparations, and an extensive series of paintings and engravings, as well as models in wood, plaster, and wax. The pieces totaled about 2,000. In December of 1858 the Mütter Museum was formally recognized and housed in Jefferson. Three months later, Thomas Dent Mütter died at the young age of 47. Today, the Mütter Museum can be found on 22nd Street, near Market in Center City, Philadelphia.

If not for the Mütter Museum, Thomas Dent Mütter’s name may have been lost to history. Many such names are. And, while Mütter’s name and accomplishments may not rank with those of Koch, Pasteur, or Lister, his story deserves to be told and deserves to be heard. ■
A man presents with a history of atrial flutter, asthma, and possible sarcoid disease, and currently has shortness of breath along with clinical evidence of ischemic strokes versus metastatic tumor. The patient declines in health and subsequently passes during treatment in the hospital.

Quiz

1. Gross impression at the time of autopsy would include all of the following except:
   a. Carcinoma of the lung
   b. Carcinoma of the heart
   c. CJD
   d. Infection of the chest cavity

2. The hemorrhagic infarct within the brain can be related to the fungal infection of the heart and heart valves.
   a. True
   b. False

3. The small pockets of purulent material within the cardiac muscle are indicative of metastatic tumor, not infection.
   a. True
   b. False

Answers found on page 23 >
Name: Chevanne Scordinsky

Chevanne has been a PA for 7½ years. She is employed with Atlantic Health Consolidated Laboratory in Morris Plains, NJ.

Favorite travel destination?

The hot springs in Edipsos, Greece is by far my favorite. On the highway up you can smell sulfur in the air. At the beach, hot-to-boiling water evolves from spouts in the earth, gathering into shallow pools of golden orange and gray-green rock where you can sit out and look onto a nearly turquoise ocean. It is an incredibly relaxing and tranquil experience. The mountains slope sharply into the sea, so from almost any beach you can see them. The town itself has centuries-old, abandoned bathhouses where springs run right through the rooms. In addition, absolutely everything we ate there was delicious, from seaside restaurant to busy corner cafe. One particular phyllo pastry called Bougatsa containing a sweet, creamy filling, is worth going back for.

Where would we most likely find you on a Saturday night?

I’m a cheap date, so I love getting burgers and milkshakes. It’s great family time and there’s usually bacon involved, so that’s a plus. Saturdays are also when I run many of my errands so we might go out after dinner for crafts, toys, or home supplies. On nice nights we go for walks or to a local park. Then it’s back home for movie night after my daughter is asleep. We pop kernels, get out the wine, and usually go for an action or thriller movie. As of late, though, we’ve been binge-watching Boardwalk Empire and The Knick.

What’s your favorite specimen to gross?

Complex head and neck specimens are my favorite, but I would say partial mandibulectomies are on my top tier. You go through the whole tool box: scalpel, forceps, saw, hammer, pliers… the documentation of extension alone can yield some very impressive sections that tell a great story. The beauty is that while visually intimidating, cassette submission is surprisingly straightforward and minimalist. Grossing these specimens helped quell my apprehension toward grossing larger cases. I approach them pragmatically and go by the carpenter’s rule: measure twice, cut once.

What’s your most memorable case?

One day the accessionists were abuzz over a specimen and I went over to see them gawking at an open container -- it was an entire ear. I promptly called “dibs” and went about a section plan. There was squamous cell carcinoma lining the canal that extended very close to the tympanic membrane. A cone-shaped resection of bone was cored with a small portion of nerve at the end. I was able to probe the canal and get a gorgeous section all the way through, which included bone. The photographs were a great keepsake.
Which direction do you see the profession headed in the next five years?

With the caliber of professionals graduating, their varied responsibilities on the job, and technical expertise, I see PAs more routinely expanding the scope of their practice beyond the gross room. With the help of documents like the Grossing Guideline, I see PAs becoming increasingly in tune with the diagnostic facet of pathology, gaining greater insight at sign out of surgicals and cytology. I hope to see more and more PAs running departments and creating the optimized, high-quality laboratories that patient care deserves. I hope to see PAs branching out into research or procurement. I have confidence in our capabilities as professionals.

Favorite movie?

American Beauty is probably my all-time favorite. It is so layered with significance and detail, precisely the type of well-crafted story I love. My husband and I spent months examining its themes, use of color, and keeping the soundtrack on loop. It’s more than just the story of a man who unhinges himself from a stifling existence, because each character encompasses some painfully accurate part of life. It’s just brilliant.

Favorite restaurant?

If Joe Beef was in New Jersey instead of Montreal, I would go broke eating there weekly. The menu mixes some traditional fare, like roast chicken or duck, with the exotic, like their infamous Foie Gras Double Down. You can tell everything is crafted with an obsessive attention to detail by the way tastes meld so harmoniously. While the food is more highbrow, the atmosphere is relaxed. The waiter (who was in a wolf tee shirt) must have fancied us so precious for ordering separate starters and entrees while two veteran couples on either side of us shared. But we wanted to try out as much as possible! After our entrees and drinks, we put our trust in the waiter’s hands and let him choose our desserts. One of them was a thirty-layer cake with chocolate, hazelnut praline, and other sorcery. Obviously. Surrendering your will to the chef… that’s magic.

Bad habits you’d like to break?

One of the worst inventions is the dreaded snooze button. Procrastinators and sleep enthusiasts like myself have been made forever lazy by it. Sad to say, I’m a serial snoozer and every minute I sleep after my alarm goes off, is a minute I run late. As a consequence, I forget at least one thing everyday. It’s a terrible domino effect. I’ve really been trying to kick the habit and lately have been getting up instead of snoozing. I’m on day seven and I swear it’s changed my life. Ha!

Best advice you ever got?

I have to preface this by saying there are former colleagues who have been essential to my growth as a human being. They helped me in word and deed to become more mature, cultivate temperance and foresight. My experience with them encompasses the best, but if I had to pick a discreet piece of advice, it would be this: “Don’t take it personally.” Everyone has an internal struggle and what they say or do is a reflection on them. We cannot know someone’s intentions, whether vindictive or simply dismissive. Leave it be. There are bigger pictures at work, and fixating on every word or perceived snub is mentally exhausting. It took me a long time to understand the value of that nugget, but realizing how faceted a situation can be freed me.

If you weren’t a PA, what other line of work would you enjoy?

My first passion is linguistics. I love everything about where language is derived, how it changes, and how it’s structured. It started early on when my mother and I would examine word origins in Patois (Jamaican dialect of English) by reading the poetry of Louise Bennett-Coverley. We’d predictably interrupt Sunday dinner conversations at my aunt’s with our analyses, and marvel at the creativity of the language. More recently, listening to some English and Irish speaker dialects reminds me of some Patois pronunciations. It’s fascinating.

In college, I studied Arabic and it was a whole different way to relate concepts to written word. I had no crutch of Latin letters on which to lean and the mental exercise was one of those realizations that turned on a light bulb. So if I weren’t a PA, I’d be an Arabic linguist.
Toronto Recap
by Heather Manternach, Conference Chair

It is hard to believe that it has been more than a month since the 41st Annual Continuing Education Conference at the Fairmont Royal York in Toronto. How time flies! The week was filled with great speakers, great food, and great fun.

We started the week with the Annual Fun Run/Walk along the beautiful Harbourfront. About 25 attendees participated. Thank you to Lisa Ware for organizing the run/walk! Look for a change in format for the Fun Run/Walk in San Diego. The Welcome Party on Sunday evening was a chance to reconnect with old friends and classmates and meet fellow PAs. One of my favorite parts of the welcome party was the chocolate waterfall! Thank you to Mollie Patton for all of your hard work choosing the food and beverage for the conference. Everything was delicious!

Monday morning began the week-long continuing education lectures. We were fortunate to (again) have interesting and knowledgeable speakers, with topics ranging from pediatrics, to colorectal cancers and whipples, to breast and bone and soft tissue. We were privileged to have three lectures and a workshop given by fellow PAs. Thank you to Skip Winters and Megan Thompson for the wonderful job you both did in speaker recruiting!

The 21st Annual Golf Classic was held at the Royal Ashburn Golf Club in Ashburn, ON. The course was beautiful, and the weather was sunny and warm. Thank you to Larry Marquis and Mark Anderson for picking another great golf course and organizing the event. I hope everyone considers golfing next year in San Diego.

We changed the format of the poster sessions this year, which took place on Tuesday and Wednesday afternoons and were a great success! We have heard a lot of positive feedback from the attendees, so this poster session format will be back next year! Thank you to the Education Committee for creating and implementing the well-organized and well-received poster sessions.

Happy Hour with the Exhibitors on Wednesday evening was very well attended. The exhibitors were thrilled with the amount of attendees that they got to see. I hope you all had time to stop by the AAPA booth to spin the wheel and possibly win a prize!

I would like to thank Elizabeth Fygina for leading the yoga classes. We had five classes over the course of the week. I heard nothing but wonderful feedback from those who attended the classes. We hope to offer some type of wellness activity at future conferences.

I hope that you all had time to visit the sites, attractions, and, of course, the restaurants that Toronto had to offer. And I hope that you were able to take back some valuable information to share with your colleagues and use at your workplace. We are the only conference dedicated solely to PAs!!

We are continually looking to improve the conference and have some changes in store for next year. We value your input, so please email me with any comments or suggestions at conferencechair@pathassist.org.

See you next year at the Hotel del Coronado for the 42nd Annual Continuing Education Conference in sunny San Diego, September 10-16, 2016!
BOT & Committee Chair Meeting on Sunday

Executive Director Michelle Sok updates attendees

BOT Award Recipient Dennis Strenk with Executive Director Michelle Sok and BOT Chair Jon Wagner

Fun Run/Walk Participants

Tom Reilly receives the Lifetime Achievement Award

Oldest PA, Coy Wagner, and youngest PA student, Meagan Guertin
Student Delegates

Student Delegate Award Winner Sydney Cooley

Student Roundtable

Poster Session - Monica McMahon of Drexel University - Sacramento

Poster Session - Emily Wagner, PA

AAPA Booth prize winner, Leslieann Gilbert

Poster Session - Oslo University Hospital
Conference Committee Chair, Heather Manternach, and Rachel Reich from the Central Office, take a break after a long and successful week.

Attendees headed to “A Guide to the Autopsy for Pediatric Heart Disease” workshop with Dr. Taylor.

“Hands-On Examination of Congenital Heart Disease” workshop participants.

Dr. Jagdish Butany’s “Cardiac Anatomy and Surgical Pathology” workshop attendees.

Toronto Conference CE Lectures Coming Soon!

Miss getting your annual CE? No worries! Get your CE online with lectures from the 2015 Annual Continuing Education Conference.

View the lectures through our website’s on-demand streaming and then take the online quiz at the conclusion of the video. Your CE credit will appear in your CE Journal within three business days.

The lectures are priced individually at $22 for members and $36 for non-members. Purchase the entire set at the discounted rate of $399 for members, $699 for non-members.
Committee Vice-Chair and unofficial AAPA conference photographer and historian.

Over the course of your career, how have you seen the PA profession change?

CHERIE: Pathologists have gained a better understanding of what PAs can do, and our level of training. Residents graduating now usually want to work with a PA and appreciate our level of training. It takes far less time “to prove yourself” in a job than it used to, and I think that speaks to the excellent training the students receive in all the programs.

JERRY: Changes in the profession are substantial and continue to revolve around dissection skills at the bench. We remain the desired/essential interface between submitting surgeon/clinician and pathologist, often teaching others as well as doing dissections. Our administrative and educational duties often include personnel management, conference preparation, resident and/or medical student training, and tissue banking. Diagnostic criteria have grown more complex and PA skills and capability have had to keep pace. The other major change is the increased number of pathology groups with multiple PAs.

JIM: PAs have grown into true health care practitioners, interacting with and providing services for patients and the members of the health care team at all levels. They have evolved into critical members of the laboratory medicine team by their education, technical skills, and ability to adapt to new methodologies in an ever-changing health care environment.

STEVE: The PA profession has changed by leaps and bounds thanks to the quality and professionalism of our members. Our popularity and the status of having a PA on staff as a luxury vs. having a PA on staff in every histopathology lab as a necessity for quality patient care speaks for itself. If my wife and I were to move anywhere in the US, Canada, or overseas, finding a PA position wouldn’t be what it was when I started!

What is one way you would like to continue impacting the PA profession?

CHERIE: I would like to see our Scope of Practice updated so it truly reflects what we do and can do, what we are trained for. I would like to encourage more of the newer PAs to become involved in the AAPA, ASCP, and NAACLS. Involvement with any of these organizations provides a great learning experience as well as being able to get to know other lab professionals and Pathologists.

COLLEEN: I think we need better career promotion at an earlier age. High school students or middle school students should be our target. Lab professions in general are struggling for recognition and we are facing staffing shortages in many areas. I think we need to move beyond just promoting our profession to CAP and more toward hospital administration groups to gain recognition. I would love to be a part of that.

JERRY: I will probably continue as a NAACLS volunteer doing PA program accreditation reviews and site visits. I will also continue utilizing my knowledge of the accreditation process, having just been appointed to a public member position on the Review Committee for Pediatric Dentistry Education of the American Dental Association.

JIM: Education of current and future PAs by staying involved with didactic and clinical education of the Drexel University College of Medicine PA students; mentoring future PAs by offering shadowing opportunities and counseling future students in career paths in laboratory medicine.

STEVE: I won’t limit how long or what I wish to offer as an active member and as a contributor. I only want to enhance the growth of the PA profession based on education and patient care.

What influenced you in choosing to become a PA?

COLLEEN: I was a med tech, but was frustrated with the ever-increasing role of automation. I missed the hands-on work. I shadowed a PA and loved what they did.

JERRY: I was a pre-med student during the height of the Vietnam war. A dean of my undergrad school suggested I look into physician extender programs which were quite numerous and varied at that time. The PA program seemed to have the most autonomy and Duke University had a great academic reputation.

JIM: A pathologist mentored me during a pathology internship at York Hospital during my undergraduate years at Gettysburg College.

STEVE: My family, two pathologists, many coworkers when I was a medical technologist, and Leo Kelly. I wanted to pursue a career in science and having a medical technology background gave me the confidence to take advantage of an opportunity. In essence, many people in my life made and influenced why I chose the PA profession.

What is the most rewarding aspect of being a PA?

CHERIE: For me, as a Program Director, I invest so much in every student. Watching students come into the program, work so hard to learn and grow, becoming professionals then watching them go out to their first jobs, get that first pay check, be happy in their profession and then see them lead happy lives. It is extremely rewarding and satisfying.

COLLEEN: It never gets old or boring. I have been doing this for 20 years and it is still just as challenging. I still think I have the best job ever.

JERRY: There have been many rewarding aspects of my career. My career has provided a great standard of living to raise a family and save for retirement. Other aspects include participating in the growth, development, and maturing of the AAPA to a level of prominence. On a daily basis I am treated as a knowledgeable and capable professional.

JIM: Recognizing that we as individuals and as professionals can have a dramatic impact on patient care.

STEVE: The most rewarding aspect has been the ability to love what I do every day for 32 years and provide for my family. I have been blessed with a rewarding and fulfilling career thanks to the PA profession. Having developed friendships, worked together among colleagues in the medical profession, and shared my expertise with PAs, aspiring PAs and interested students makes me realize that I haven’t really worked too many days of my life (except maybe a couple when working for or with people I didn’t respect). Another rewarding aspect is that PAs are a happy group who love what they do -- most make it a life-long career.
As the end of the year approaches, I have much to be thankful for. Thank you for the honor and privilege to serve as your Executive Director. I am very fortunate to be able to enjoy what I do each and every day and to work with such talented staff. Thank you to our tremendous volunteers who give of themselves on a daily basis by volunteering their time and talent for this organization. Your dedication and commitment are truly inspiring. Thank you to our members, all 1,700+ strong, for your support of the AAPA, the only organization for and by pathologists' assistants.

One of my favorite quotes shared with me by AAPA member Rick Daniel is from Vince Lombardi, “Individual commitment to a group effort – that is what makes a team work, a company work, a society work, a civilization work.” On its own, individual commitment is a powerful thing, but when you multiply it for one common purpose, it turns into something great.

So the question then becomes how can we get you as members more involved and engaged in YOUR association? These are your peers. This is your pathologists’ assistant community. Take advantage of getting to know, interact, and learn from your fellow members. I’ve heard wonderful stories about PAs connecting at a conference which leads to a job opportunity, or members who have volunteered to give back and have found that they have gained so much more in return by building a strong network of peers and forming lifelong friendships.

For those of you who already give in so many other ways or feel there just isn’t enough time in the day, know that your participation, no matter how big or small, makes you a contributing member of this community and in turn pushes this association and the profession forward.

Here are just a few suggestions on how you can get involved:

- Follow us and stay actively in the know about association activities
- Share association news
- Participate in our website forums and social media discussions
- Complete association CE offerings
- Participate in our surveys and ballots
- Promote Pathologists’ Assistant Day at your institution
- Write articles, create content, serve as a peer-reviewer
- Submit your best work for our scholarships and photo contests
- Present a lecture or poster, recruit our speakers
- Attend our conferences, plan our conferences

- Volunteer within a range of micro opportunities such as staffing the PR booth, to participating in a task force such as the salary survey, to committee work, to serving on the Board of Trustees (BOT)

The more members we have who are participating and engaged, the stronger our association will be.

To demonstrate what we can accomplish together, here’s a few upcoming projects your fellow members are currently developing:

- Monthly CE article and quiz releases
- Conference scholarship opportunities (to be released later this year)
- Toronto lecture recordings (to be released later this year)
- Beyond the Bench, Volume III (to be released later this year)
- 2016 AAPA Calendar (to be released later this year)
- PR booth travel and promotion, with the next stop being USCAP in March
- AAPA Spring Meeting in April, and Fall Conference in September
- 3rd Annual Pathologists’ Assistant Day – April 14, 2016

If you want to Get Involved or have questions about how you can, please visit pathassist.org/?Volunteer or contact our office with any questions you may have.
I am writing this report just a few days prior to the Board of Trustees working weekend. During the working weekend, the entire board will meet at our central office in Minnesota. We will engage in lengthy discussions about our association and our profession. And, as we course through those discussions we will be forced to look ahead, anticipate what lies down the road, and begin making adjustments now.

As I prepare for the working weekend, there are a few items that are in the forefront of my mind, sculpting what I see as key elements in the conversation.

First, we are seeing the AAPA job hotline subscriptions increase. Not surprisingly, just a few years ago, when the reimbursement reduction was initiated, there was a decrease in new job postings. Now, we are seeing that trend correct to the positive. In addition, that correction is occurring in spite of the aforementioned reimbursement decrease. Moreover, early data suggests that the new graduate starting salaries have also leveled out and may be starting to increase.

Second, discussions continue regarding the potential workforce shortage. Perhaps this is influencing my earlier observation; however, I would argue that, if it is influencing the job market, the influence is secondary. The data I am familiar with suggests that hiring is occurring in response to need, not as a pre-emptive maneuver. Thus, it is my conclusion that the workforce shortage may lend a more positive impact to the job market for pathologists’ assistants.

Third, pathology residency programs continue to confront the challenges of training residents in grossing — and these challenges are coming from two sides. On the one hand, pathologists have to master an already massive and ever growing quantity of molecular information. On the other hand, regulators are quite stringent about the total quantity of time a resident is allowed to invest in mastering pathology. These contribute to a difficult circumstance — more learning is required, against the challenge of less time to complete the learning. One outcome is a direct affront to the time residents have to invest in the gross room.

Finally, all of the preceding points lead toward the conclusion that the utilization of pathologists’ assistants is growing and the potential for additional growth is a compelling possibility. Moreover, the utilization of pathologists’ assistants is unique among allied health practitioners. Our closest counterparts, physician assistants, obtain a skill set that prepares them to extend a physician. This is done by way of duplication of knowledge to engage a larger volume of patients within a single practice. In contrast, it would seem that pathologists’ assistants are acquiring a skill set that is being carved out of pathology residency programs. Not entirely, but the shift is noticeable.

How does all this shape the conversation in the board room? Quite simply, we have to look at what the current reality is, and anticipate the changes that reality will impose on our profession, our laboratories, and our patients. Then we have to respond. And, while the response addresses the current needs, at the board level, it also has to address the anticipated needs. And there is a tension in that work. We cannot accept accommodations for present realities as an adequate confrontation to future challenges. And so, off we go. In the coming days, a new canvas of vision will be laid out. In all likelihood, you will be asked to participate in a survey aimed at providing actionable data. While I need to wait for the working weekend to discuss the particulars, I can say that this board will not be shy with our intentions. In addition, the committees and subcommittees within this organization are a formidable force, well positioned to leverage us to the next level. Stay tuned!
Gross Photo Tutorial

Lethal Infection: Aspergillus Fumigatus

Sometimes the gross impression can lead you down the wrong path. During the autopsy procedure of this case, the heart and left lung were tightly adherent to the chest cavity. Tissue was submitted for cultures. Once removed, the external surface had the appearance of necrotic tumor, possibly some sort of carcinoma. This irregular tissue extended through the lung into the atrium of the heart.

Following fixation, dissection of the heart and lungs revealed a necrotic appearance, more indicative of infection, with pustular abscesses throughout the ventricles and septum. Surrounding and within the lung tissue are lymph nodes replaced with necrosis, and inflammatory tissue completely replacing the lymphoid tissue and extending into the lung parenchyma, while also surrounding the great vessels. Histologic sections of the heart revealed fungal hyphae within the left atrium, tricuspid valve, and right and left ventricles. The hemorrhagic infarct of the brain did not show fungal hyphae; however, brain tissue did demonstrate pustular abscesses, including hyphae. Cultures grew Aspergillus fumigatus and Klebsiella pneumonia.

Quiz Answers:
> continued from page 13

1) C  2) A  3) B
YOUR MEMBERSHIP MATTERS.
STAY CONNECTED!
Renew your dues before
February 1, 2016 to avoid
late fees!

SUSTAINING MEMBERS

Sarah Olson
800.325.7785
saraho@bradleyproducts.com
www.bradleyproducts.com

Patrick O’Neill
877.846.5393
info@cancercdiagnostics.com
www.cancercdiagnostics.com

Linda Durbin
405.848.5800
linda.durbin@exaktusa.com
www.exaktusa.com

John H. Barrett
800.638.4770
jbarrett@havels.com
www.havels.com

Catherine Schrock
866.346.8522
jobs@abcareer.com
www.labcareer.com

Susanne Dresser
203.364.8544
sdresser@kubtec.com
www.kubtec.com

Kathy Rogers
800.797.9050
merrickinc@msri.com
www.merrickmedical.com

Joel Servais
866.995.5300
info@milestonemed.com
www.milestonemed.com

Leslie Volthoven
800.362.8491
leslie@mpec.com
www.mpec.com

Deborah Nicklas, PA(ASCP)
904.704.2839
deborah@nicklassstaffing.com
www.nicklassstaffing.com

Lee Weis, PA(ASCP)
565.524.5496
leeweis@earthlink.net

Nick Daniels, PA(ASCP)
577.330.7727
info@regional-pathology.com
www.regional-pathology.com

Greg Strader
425.544.5616
greg.strader@thermofisher.com
www.thermofisher.com

Pathology Assistance
Regional Pathology and Autopsy Services

American Association of Pathologists’ Assistants
2345 Rice Street, Suite 220
St. Paul, MN 55113

CHANGE SERVICE REQUESTED