Successful Treatment of Chronic Edema, Recurrent Cellulitis and Leg Pain using Autonomic Response Testing Assessment: Case Report

Abstract
A 33-year-old male, having failed standard medical assessment and treatment for disabling chronic lower leg edema and recurrent cellulitis, was able to return to work after global integrative medicine assessments and interventions: Autonomic Response Testing; Neural Therapy; Acupuncture, Ozone therapy, Homeopathy, heavy metal reduction, and dietary change. Such a global approach deserves research attention.

Introduction
Infection of the Skin and Soft Tissue (SSTI), referred to as erysipelas when superficial or cellulitis when involving the subcutaneous tissue, is a common illness presenting with erythema, pain and swelling of the skin. With an incidence of approximately 16.4-24.6 per 1000 patient-years in developed countries, approximately 73.8% of these cases are successfully managed in the out-patient setting and treatment remains relatively straightforward. SSTI is one of the most common diagnoses among hospitalized patients, responsible for 7-10% of hospital admissions and ranked as the third most common diagnosis in the ER after chest pain and asthma. In addition, the number of hospitalized cases in the United States has increased from 12.1 to 21.2 per 10,000 population between 1997 and 2010, representing a relative percentage increase of 74%. The majority of those admitted for SSTI are males between the ages of 45 to 64 with the most commonly affected body part being the lower limb. Though mortality is low, subsequent morbidity is considerable with a significant burden on the healthcare system. Recurrent cellulitis remains common and has an annual rate of 8 to 20%.

We present a case of a 33-year-old gentleman with recurrent cellulitis and painful unexplained swelling of the lower extremities who responded to an integrative medicine assessment and treatment regime for multiple factors including Bartonella henselae, and sensitivity to mercury and lead. The aforementioned treatment regime was guided by the integrative medicine assessment method of Autonomic Response Testing (ART).

Based on our literature review of PubMed (includes MEDLINE), EMBASE, Natural Medicines, and CINAHL databases, there are no previously reported cases of successful treatment of recurrent cellulitis or of chronic lower leg edema using an integrative medicine approach which includes homeopathy or neural therapy. We did find a small study which successfully treated pitting edema due to venous insufficiency with topical Methylsulfonylmethane (MSM) combined with EDTA.

The following case is typical for our multi-physician integrative medicine practice which sees chronically ill patients who failed standard medical evaluation and treatment. Within the alternative and functional medicine community, the etiology of chronic disease is considered multifactorial, thus often requiring a variety of therapeutic interventions in order to achieve healing. The herein described case report is an example of a multifactorial evaluation and treatment approach. In addition to the standard medical history and physical diagnosis, the assessment method known as autonomic response testing (ART) was used along with the integrative medicine interventions of neural therapy of scars; ozone therapy; homeopathy; reduction of the presence of heavy metals; acupuncture; and dietary interventions. Table 1 describes the utilized interventions.
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Rationale / References</th>
</tr>
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<tbody>
<tr>
<td>Neural Therapy of Scars</td>
<td>Body scars were injected with 0.5% preservative free procaine. Approximately 0.5 ml per cm intradermal wheal was created with a 27 gauge, 1.25 inch needle into body scars. Tooth area disturbances due to extraction scars were treated by injecting into the extraction gum scar with 0.5 ml of a 0.5 % preservative free procaine solution and a 30 gauge, 1 inch needle. The scars and tooth area disturbances designated for neural therapy were identified by ART testing.</td>
<td>Remove interference fields from scars. (11,12,13,14)</td>
</tr>
<tr>
<td>Quaddel Neural Therapy</td>
<td>A clustered array of 0.2-0.4 ml intradermal wheals were injected using 0.5% preservative free procaine and a 27 gauge, 1.5 inch needle. Each wheal was spaced approximately 0.75 cm apart and placed into the skin over ART positive areas.</td>
<td>Remove interference fields from body areas. (11,12)</td>
</tr>
<tr>
<td>Body Acupuncture</td>
<td>Based on principles of acupuncture.</td>
<td>Balance acupuncture meridians. (15)</td>
</tr>
<tr>
<td>Reduction of the presence of Mercury and Lead</td>
<td>0.5 ml of 250 mg/5ml solution of Dimercaptopropanesulfonic acid (DMPS) was mixed with 5ml of 0.5% preservative free procaine when performing the quaddels of neural therapy on this patient as a means of local chelation. When Ca-EDTA was used 0.5 ml of a compounded solution of 300 mg Ca-EDTA per ml was also added to the syringe. Chlorella and cilantro were given orally for mercury reduction.</td>
<td>Optimization of physiological processes by reducing heavy metal burden. (16)</td>
</tr>
<tr>
<td>Ozone Theory</td>
<td>Three minutes after a tooth disturbance area was injected with procaine, approximately 0.3 ml of 11 gamma ozone gas was injected at the same site as the procaine injection.</td>
<td>Enhance Neural Therapy of tooth extraction scars. (17)</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>The appropriateness of a homeopathic remedy was determined by ART assessment.</td>
<td>Treat occult infectious processes indicated by ART assessment.</td>
</tr>
<tr>
<td>Dietary Factors</td>
<td>Gluten free diet and multi-mineral supplement as indicated by ART assessment.</td>
<td>Remove dietary factors. (18)</td>
</tr>
</tbody>
</table>
Background information on neural therapy and autonomic response testing

Neural Therapy of Scars and Teeth

Neural therapy is an injection technique that was developed during the early 1900's in Germany by Walter and Ferdinand Huneke. The premise behind this therapy is that scars and other types of damaged tissue can lead to over excitation of efferent neurons within the autonomic nervous system resulting in so called "interference fields" which can result in symptoms such as nausea, vomiting or pain. Neural Therapy treats the presence of interference fields via injection of procaine. The solution is injected intra-dermally into active scars as well as through the use of clustered 0.5 cm intradermal blebs (also known as quaddels) over generalized areas of interference. Interference fields resulting in pain/dysfunction in bodily locations remote to the interference field location is not an unknown physiologic idea and has been described within the conceptualizations of referred pain and osteopathy. In our presented case, the patient had interference fields on the lower legs, chest, nose and gums.

Autonomic Response Testing (ART)

Autonomic Response Testing (ART) is a form of applied kinesiology. Applied kinesiology (AK) is a form of manual muscle testing in which an interpretation is made regarding the response (weakness, no change, or strengthening) of a muscle to manual testing. The interpretation informs the assessment of the patient and the prediction of positive, negative, or neutral responses to therapies. Different forms of applied kinesiology can give different results. There are no published studies that have evaluated ART's reliability and validity. We hope this case study will prompt such studies. Our clinical experience with ART as an assessment tool has been very positive.

The usefulness of different versions of AK can be likened to different antibiotics. Although antibiotics are designed to inhibit or kill microorganisms, their effectiveness depends on the clinical situation in which they are applied and is determined by the outcomes resulting from their use in real life clinical situations. Like different forms of AK, the success or failure of a given antibiotic cannot be generalized to other antibiotics without further clinical evaluations specific to those other antibiotics. One can also liken the assessment aspects of the various forms of applied kinesiology to diagnostic tests that vary in regard to sensitivity, specificity, positive predictive value and negative predictive value.

A systematic review of AK studies (ART was not included in the review) by Hall et al. was unable to draw clear conclusions and recommended studying applied kinesiology utilizing a pragmatic study design. Schwartz et al. recently published a negative study, however, no distinction was made regarding the various forms of AK. Based on the study's description of how the applied kinesiology was performed, it is clear ART was not specifically evaluated. No designation was given as to which form of AK was being tested.

Case presentation:

History of Present Illness

This is the case of a 33-year-old white male with a 4-month history of recurrent swelling and aching of the feet, legs and knees along with severe fatigue and weakness. The patient was initially seen for the swelling in the ER and was started on antibiotics for 5 days. The swelling resolved only to recur a few days later. The patient returned to the ER and was given another course of oral antibiotics and this again helped somewhat but the swelling returned once the antibiotics were completed. The patient was then hospitalized and treated with IV antibiotics for a week. During that admission, the patient also underwent a bilateral venous ultrasound of the legs along, with blood work as well as a cat scan, all of which were negative. The patient was evaluated by a vascular surgeon who suggested he wear compression stockings and keep his legs elevated. Following that admission, the patient experienced continued swelling and redness in the legs bilaterally while being maintained on antibiotics for a period of 2.5 months. During that time, he was evaluated by oncology, infectious disease, and internal medicine. The compression stockings were discontinued due...
to lack of efficacy. He notes that he gradually decreased his physical activity due to the leg pain and swelling until he was ultimately forced to stop working and go out on disability. This occurred approximately one month prior to being evaluated at our practice. The patient had been working as a machinist which requires a certain amount of physical activity in order to effectively perform this type of work.

**Past Medical History**

Ten-year history of chronic back pain secondary to a motorcycle accident.
Fracture left shin.
Metallic shrapnel in the chest due to metal working injury.

**Medications**

Oxycodone for chronic back pain secondary to his motorcycle accident 10 years ago prescribed by a pain management physician.
Alprazolam for anxiety disorder prescribed by a psychiatrist.

**Supplements**

B6 over the counter supplement

**Social History**

One pack per day cigarettes for many years.
Negative history of alcohol or drug use.

**Allergies**

No known drug allergies.

**Family History**

Patient reported a family history of arthritis in his mother and cancer of the pancreas in his father. His father and mother both had a history of Grave's disease.

**Dental History**

Patient had all 4 wisdom teeth extracted. He also had several amalgam fillings.

**Review of systems**

At his initial visit, he admitted to weakness, fatigue, ongoing bilateral leg swelling and aching in the calves as well as difficulty sleeping, concentrating and difficulty with balance.

**Physical Exam**

At the patient's first visit he was found to have bilateral lower leg edema, erythema and tenderness of the calves and ankles. There were no visible lesions or ulcerations of the skin. ART testing was positive for Bartonella in the area of the legs bilaterally and the head. Chlamydia pneumonia was also assessed in the patient lungs via ART. The patient was negative on ART testing for Borrelia, Ehrlichia, Mycoplasma, Babesia and Herpes types 1 and 2. ART was positive for both mercury and lead sensitivity and/or presence in the lower legs and mercury in the head. This was consistent with the patient's profession as a machinist and the presence of several amalgam fillings in his mouth which could act as a source for mercury. ART was also positive for yeast in his abdomen as well as a sensitivity to gluten. The patient had multiple active scars (scars acting as interference fields) detected by ART including a scar over the chest, the left anterior lower leg and several in his mouth, which included the scars along the gums where teeth #18, 28, 38 and 48 (according to the International classification for teeth) had been extracted. Based on the patient's extensive pre-visit medical evaluations, our standard medical evaluation, ART evaluation and our clinical experience, a treatment plan was initiated. See Table 2.
Visit #1 – Initial Visit

Neural Therapy was performed for the chest scar and for the four tooth extraction scars which included ozone therapy. NT in the form of quaddels (See Table 1) was applied to the lower legs where edema was most pronounced. Acupuncture was also performed. The patient was prescribed 2 homeopathic remedies, one for Bartonella (Bartonella Series Therapy, Deseret Biologicals, Sandy Utah) and one for yeast (Mycologic Immune Stimulator, Professional Formulas, Lake Oswego, Oregon). ART testing predicted effectiveness for both homeopathics. The decision was made at that time to defer treatment of the Chlamydia Pneumoniae detected in the lung via ART because the patient did not have any respiratory symptoms. The other issues, especially those detected in the legs were felt to be treatment priorities. In addition, he was placed on a gluten free diet and started on chlorella (Chlorella pyrenoidosa, Biopure, Bellevue, Washington) 15 tablets three times per day. The chlorella was predicted to be useful per ART. See Table 2.

Visit #2 – One month after initial visit

The patient reported that his legs felt very good for 2 weeks but then the swelling slowly returned but not to the original severity. He reported 30-40% improvement in the swelling and 30-40% improvement in pain overall. There was some improvement in the erythema and swelling in the legs on physical exam. ART was positive for Bartonella and the usefulness of the Bartonella homeopathic remedy. The patient was again found to be ART positive to lead, mercury and wheat. ART testing for yeast was negative. The patient was asked to continue the Bartonella homeopathic drops, chlorella and a gluten free diet. He was also started on concentrated cilantro drops (2 full droppers in a hot beverage once per day) at that visit to further help with mercury removal. The chest scar and wisdom teeth extraction scars were again found to be active via ART. Neural therapy was performed for those areas. On this occasion Ca-EDTA was also added to the procaine solution. Procaine quaddels were performed bilaterally to the lower legs over the areas of edema. Acupuncture was also performed. See Table 2.

Visit #3 – Two months after initial visit

At the third visit the patient informed us of a nose scar that he had forgotten to tell us about previously. He reported no leg swelling for the past month. He felt well and intended to go back to work in the next few weeks. On exam, his swelling and erythema were now resolved. On ART testing, the patient tested negative for Bartonella and yeast; tested positive for mercury in general and specifically over the right leg; tested positive for lead in general; the nose and chest scars tested positive for interference fields; and finally the tooth extraction scars tested negative. ART testing predicted benefit from mineral supplementation. The patient was started on a mineral supplement and continued on Bartonella remedy homeopathic drops, chlorella, and cilantro. Neural therapy was performed for the nose and chest scars. Quaddels were performed bilaterally over the lower legs and over the right ankle. Acupuncture was again performed at the following points: SP6, SP9, KI3, LI4 and St36 bilaterally. See Table 2.
<table>
<thead>
<tr>
<th>Visit Number</th>
<th>Positive Findings on ART</th>
<th>Treatment given during visit</th>
<th>Treatment Prescribed</th>
<th>% Improvement Outcome</th>
</tr>
</thead>
</table>
| **1. Initial Visit** | • Bartonella in lower legs  
  • Chlamydia Pneumonia in the lungs  
  • Lead in the lower legs  
  • Mercury in the lower legs  
  • Gluten sensitivity  
  • Yeast in the abdomen  
  • Chest scar, tooth extraction scars and scar left anterior lower leg | • Neural therapy performed with procaine and DMPS for the tooth extraction scars and the chest scar  
  • Ozone administered for the tooth extraction scars  
  • Quadrads performed over area of lower leg edema with procaine and DMPS  
  • Acupuncture bilaterally at SP6, SP9, K13, LI4, ST36 | • Bartonella homeopathic series remedy: 10 drops under the tongue away from food three times per day  
  • Yeast homeopathic remedy: 10 drops under the tongue away from food three times per day  
  • Gluten free diet  
  • Chlorella 15 tabs three times per day | Not applicable |
| **2. One month after the initial visit** | • Bartonella in legs  
  • Chlamydia Pneumonia in the lungs  
  • Lead in the lower leg  
  • Mercury in the lower leg  
  • Wheat sensitivity  
  • Chest scar and tooth extraction scars  
  • Yeast in abdomen now negative | • Neural therapy performed with procaine and DMPS and BDTA for the chest scar and tooth extraction scars  
  • Ozone administered for the tooth extraction scars  
  • Quadrads performed over area of edema with procaine and DMPS  
  • Acupuncture bilaterally at SP6, SP9, K13, LI4, ST36 | • Bartonella homeopathic series remedy continued  
  • Yeast homeopathic remedy continued  
  • Chlorella 15 tabs TID  
  • Gluten Free diet  
  • Concentrated Cilantro 1 full dropper in a hot beverage QD | 30-40% improvement in swelling  
  30-40% improvement in lower leg pain  
  Erythema improved |
| **3. Two months after initial visit** | • Nose scar  
  • Bartonella negative | • Neural therapy performed using procaine, DMPS | • Complete Bartonella homeopathic drops  
  • Continue chlorella  
  • Swelling and pain completely resolved  
  • Erythema resolved | |
| **4. Follow-up telephone interview eight months after initial visit** | • Yeast negative  
  • Mercury and lead continued to be present in the lower legs  
  • Chest scar ART positive  
  • Tooth extraction scars and leg scar were no longer ART positive  
  • ART positive for low minerals | • And Ca-BDTA into the nose, and chest scars  
  • Quadrads performed bilaterally over the lower legs and right ankle with procaine and DMPS  
  • Acupuncture bilaterally at SP6, SP9, K13, LI4, ST36 | • Continue concentrated cilantro  
  • Mineral supplement | • Patient intended to return to work.  
  • Patient has returned to work and all symptoms have resolved |

Abbreviations: ART- autonomic response testing; DMPS- dimercaptopropanesulfonic acid
Follow-up Telephone Contact – Eight months after initial visit:

Patient informed us that he is doing well and has had no further erythema, swelling or pain in the legs. He also informed us that he had returned to work shortly after his third visit.

Cost analysis

Most of the cost of evaluation and treatment was paid for by the patient. Insurance paid for $150.00 of the total cost of $1,120.00. See Table 3. Returning to work was a significant economic benefit of treatment.

Discussion

This is a presentation of a 33-year-old male with a prior history of 4 months of unexplained recurrent lower limb cellulitis, pain and edema resulting in work disability. The patient failed standard medical evaluation and therapy which included: several ER visits, hospitalization, consultation with multiple specialists including infectious disease, blood work, modern diagnostic procedures, and oral/IV antibiotics. All of these medical experiences could have produced a placebo response but did not. The patient subsequently experienced relief of his pain and edema and was able to return to work after two months of a multipronged integrative medicine assessment and therapeutic approach which included ART, homeopathy, neural therapy, ozone therapy, acupuncture, heavy metal reduction, and a dietary intervention.

In our facility, which sees chronically ill patients who have failed standard medical therapy the ultimate goal is to alleviate all pathologic factors as expeditiously as possible, therefore, multiple treatments are given simultaneously. Patients with prior work-ups are spared additional blood work and diagnostic testing unless there is a clear indication for further testing. Additional blood work and other diagnostic testing is often not paid for by insurance by the time patients reach our facility.

ART positivity of lead and mercury in the patient’s legs could be explained by a potential occupational exposure since the patient works as a machinist.

Integrative assessment in the form of ART indicated concomitant infection with Bartonella henselae in the patient’s lower extremities. There is precedent in the medical literature for atypical manifestations attributed to Bartonella infection including chronic recurrent painful
ulcers of the toes, distal axonal sensorimotor polyneuropathy and Raynaud's phenomenon.\textsuperscript{23}

In the absence of a history of cat scratch, transmission of Bartonella could theoretically be accomplished through tick transmission as ticks commonly feed on bartonella-infected animals and Bartonella DNA has been detected by polymerase chain reaction (PCR) in ticks.\textsuperscript{24} New Jersey, where this patient resides, consistently has one of the highest incidences of tick borne diseases within the United States. Schulze et al. (2003) reported the infection prevalence of tick-borne B. burgdorferi in Ixodes scapularis (deer tick) as 49.3\%. Several other tick-borne diseases have become a concern in New Jersey, including human granulocytic ehrlichiosis (HGE), human monocytic ehrlichiosis (HME), and babesiosis.\textsuperscript{25} Newly described tick-transmitted infections continue to be observed in New Jersey and elsewhere such as the recently described illness attributed to Borrelia Myomotoi.\textsuperscript{24}

It is not possible in the context of this case to determine which factor, or combination of factors, played the primary role in producing the clinical manifestations of his disease nor which intervention or combination of interventions was paramount in the successful outcome. It is our opinion and generally accepted within the integrative medicine profession that multiple factors lead to the manifestation of chronic disease. Monotherapies are usually ineffective in bringing about a resolution in chronic disease while combined therapies have been helpful in chronic conditions such as HIV, cancer and cardiovascular disease.\textsuperscript{22}

The main limitation of this case report is that it is a retrospective case report. Retrospective case reports are at the bottom of the research report hierarchy. The purpose of publishing this case report is to alert the research community to the possible value of the described assessment and treatment approach. We have detailed our report in such a way that all the observed possible confounding variables, scars, micro-organisms, heavy metals, gluten sensitivity, and dietary minerals were acknowledged. More vigorous prospective future research is called for. We are open to collaboration with others.

**Conclusion**

We present a case of recurrent cellulitis and unexplained peripheral edema with chronic pain resulting in work disability for a metal worker. He was successfully treated with an integrative medicine assessment and treatment approach without side effects. Given the substantial burden that chronic pain and recurrent cellulitis places on both patients and the healthcare system, it would be important to consider tick borne illness, heavy metal burden, scars, yeast and dietary issues as a possible multifactorial etiology in refractory cases. A multi-pronged integrative medicine approach utilizing ART as an assessment tool and multiple integrative interventions may prove to be an important means of successfully treating chronic pain and chronic unexplained disease. Such an approach warrants further research.

**References:**


24. Wormser GP, Pritt B. Update and commentary on four emerging tick-borne infections: Ehrlichia muris-like Agent, Borrelia Miyamotoi, Deer Tick Virus, Heartland Virus, and


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