Masticator space abscess following intramuscular stimulation

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SUMMARY
A male in his 50s presented to the hospital with preauricular tenderness, trismus and dysphagia. He had intramuscular stimulation of his left temporomandibular joint region performed 4 days prior and described worsening pain and swelling since. A CT scan revealed an abscess involving the left masticator space. Incision and drainage of the abscess was performed, and the patient was discharged home on oral antibiotics 11 days later. This is the first report of masticatory space abscess following intramuscular stimulation of the temporomandibular joint area. Acupuncture and intramuscular stimulation are common complementary medicine therapies that are generally considered safe; however, adverse events such as deep neck space infection have been reported in the literature. Current regulation of training requirements and licensure for needleling therapies is highly variable. Standardisation of training and practice guidelines may help mitigate the risk of adverse events related to needleling therapies in the future.

BACKGROUND
Needling techniques such as acupuncture and dry needling are common complementary medicine therapies used to treat myofascial pain syndromes by insertion of a thin monofilament needle into various muscles. Acupuncture involves inserting needles into predetermined locations based on a system of traditional Chinese medicine energy channels called meridians, whereas dry needling involves inserting needles through skin into muscle and scar tissue. Intramuscular stimulation (IMS) is a type of dry needling that involves transcutaneous needle insertion into areas known as myofascial trigger points—localised areas of hypersensitivity within palpable taut muscle. While needling techniques are generally considered to be safe, there are reports of adverse events such as infection in the literature. The majority of studies evaluating needling complications focus on acupuncture, with a scarcity of literature addressing other needling techniques such as IMS. We present the first documented case of masticatory space abscess following IMS to muscles of the temporomandibular joint (TMJ).

CASE PRESENTATION
A male in his 50s presented to the emergency department complaining of facial swelling. He reported a 4-week history of left TMJ discomfort and mild trismus with no systemic symptoms of infection. He also expressed feelings of anxiety relating to the COVID-19 pandemic and an ill family member. Medical history was significant for Factor V Leiden and hyperlipidaemia for which he was taking 81 mg of aspirin and 20 mg of rosuvastatin daily. His primary care provider initially treated his TMJ discomfort with sertraline and ibuprofen followed by physiotherapy, which included massage therapy and transcutaneous electrical nerve stimulation, with no effect. Given the lack of clinical improvement, his physiotherapist then performed IMS to muscles surrounding the TMJ. He developed an acute increase in oedema, erythema and severe pain of the left preauricular area accompanied by severe trismus and dysphagia over the following 4 days, prompting presentation to the emergency department. The patient was afebrile with normal vital signs on room air. Examination demonstrated prominent swelling in the left mandibular region extending from the TMJ to below the angle of the mandible (figure 1). The area was tender to palpation and no signs of drainage were identified introrally or extraorally.

INVESTIGATIONS
White cell count and C reactive protein were elevated. An enhanced CT scan of the soft tissues of the neck was suggestive of a 1.8×1.5×2.5 cm left masticator space abscess with prominent regional inflammation involving the parotid, sublingual, submandibular and parapharyngeal spaces (figure 2). Marked mass effect was exhibited by rightward tracheal deviation and compression of the left internal jugular vein.

TREATMENT
The patient was admitted to otolaryngology - head and neck surgery for surgical incision and drainage of the neck abscess with insertion of a Penrose drain. The procedure was performed under general anaesthesia using a transcervical incision within a skin crease of the neck. The patient was empirically treated with intravenous ceftriaxone and metronidazole. The patient’s pain improved immediately following the procedure, while his trismus resolved slowly over the hospital stay. Cultures taken during the procedure grew Streptococcus anginosus. The Penrose drain was dislodged on postoperative day 3 during a dressing change and reinserted at the bedside under sterile technique with local anaesthesia. A repeat CT scan was ordered on postoperative day 5 to reassess the collection after persistent swelling was noted during clinical exam. Imaging results demonstrated accurate drain placement with an overall improvement in mass effect with small

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residual fluid collections (figure 3). Drainage resolved within 10 days, after which the Penrose drain was removed. He was discharged home on oral amoxicillin-clavulanic acid for an additional 10 days.

OUTCOME AND FOLLOW-UP

At follow-up 4 weeks later, he had no residual pain or dysphagia, and his trismus had significantly improved. The oedema had completely resolved, and no further inflammatory changes were appreciated on head and neck examination including flexible nasolaryngoscopy.

DISCUSSION

The use of complementary medicine needling techniques such as acupuncture and IMS have increased in popularity in North America.15 16 The National Institutes of Health reported 3.1 million adults and 150 000 children used acupuncture in the USA in 2007,14 with an increase in prevalence of 1 million people over the preceding 5 years.15 IMS is a more recent dry needling technique developed in the 1970s, which involves needle insertion deep within muscle tissue for treatment of myofascial pain syndromes. Given the growing popularity of needling techniques, careful attention to associated complications is pertinent.

Severe complications from needling techniques are rare but potentially life-threatening.14 17-20 In 2020, Boyce et al6 looked at 20464 dry needling treatments and found 7531 (36.7%) minor adverse events and 20 (<0.1%) major adverse events, including six cases of prolonged symptom aggravation, four cases of fainting, three cases of forgotten needles, two cases of influenza like symptoms, two cases of infection, one case of excessive bleeding, one case of lower limb weakness and one case of numbness. Head and neck complications have been reported including a subgaleal abscess with intracranial spread to the epidural space in an immunosuppressed woman after acupuncture for occipital neuralgia.18 A subdural empyema was reported following acupuncture over the glabella for treatment of glaucoma.19 A single report of deep neck space infection was identified, reporting abscess of the sternocleidomastoid muscle, pectoralis muscle and aortitis following IMS. 10 Our case is the first to describe masticator space abscess as a complication associated with IMS therapy.

Infection risk from needling in the head and neck is minimised through strict adherence to aseptic technique. Inadequate disinfection of the skin or a break in aseptic technique may result in the seeding of skin flora or environmental contaminants to the target tissue. Needling through areas of skin or soft tissue infection may also result in the exacerbation or spread of infection to deeper neck spaces. Penetration of the IMS needle into the oral cavity may result in seeding of oral flora to the target tissue and represents a potential aetiology of infection for our described case given the bacteria cultured, Streptococcus anginosus, is a common oral flora. Knowledge of proper aseptic technique is especially important in the head and neck to avoid such complications, highlighting the importance of appropriate training.

Considerable variation in regulatory practices for needling therapies exist within Canada and developed countries around the world.21 Training requirements differ vastly between needling techniques. Published guidelines lack consensus on such topics as sterility and clinical technique. The WHO guidelines emphasise the necessity of cleaning needling sites with 70% ethyl or isopropyl alcohol, from the centre to the surrounding area using a rotary scrubbing motion, and the alcohol allowed to dry, while other groups do not consider disinfection of the skin necessary in non-immunocompromised individuals.22 The WHO and many national regulatory bodies strongly recommend using disposable acupuncture and IMS needles to reduce the risk of
In conclusion, skin and soft tissue infection is a serious potential complication of complementary medicine needling techniques like acupuncture and IMS. Care must be taken during needling procedures to ensure proper aseptic technique. Accurate needle placement is critical to prevent possible oral contamination of the target tissue. Practitioners performing needling therapy in the head and neck should be especially mindful of deep neck space infection given the density of vital structures and severity of complications associated with such infections. Further regulation of needling techniques along with standardized training and practice guidelines may help mitigate such risks.

Learning points

► Needling techniques such as acupuncture and intramuscular stimulation are common complementary medicine therapies that are generally considered to be safe; however, there are reports of serious adverse events in the literature.

► Deep neck space infection is a potential adverse event from needling therapies in the head and neck.

► Regulation of training requirements and licensing for needling therapies is highly variable.

► Standardised training and practice guidelines may help mitigate the risk of adverse events related to needling therapies.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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