

Plan of the course

Nerve compression syndromes of the upper limb

Academic year **2017/2018**

I. COURSE AIMS

This is a new course that provides a comprehensive outline of nerve compression syndromes of the upper limb, starting with anatomy and aetiology to in depth clinical presentation of most common clinical syndromes and their diagnostic and treatment algorithms. The practical part of the course will enable students to come in contact with patients suffering from nerve compression syndromes in the outpatient department, in various stages of the diagnostic process and treatment, as well as hands on approach in the operating theatre and with a hand therapist. The course will provide theoretical knowledge about the aetiology, clinical presentation, diagnostics and treatment algorithms of nerve compression syndromes of the upper limb. A review of the anatomy knowledge necessary for understanding of nerve compression syndromes will be provided. Through seminars and practicals, students will be provided with a rational approach to a patient with nerve compression syndrome starting with history taking, clinical examination, provocative tests, indications for diagnostic tests with an understanding of their principles, results and limitations. Hands on practicals in operating theatre will enable students to understand operative techniques of the nerve compression release and to practice basic surgical skills. Practical in the outpatient department and physical therapy department will enable students to develop communication skills and an appreciation of the multidisciplinary approach in the management of these patients.

General competencies:

Upon completing the course students will:

- possess the knowledge about aetiology, clinical presentation, diagnostic and treatment algorithm of nerve compression syndromes
- understand the principles of electrodiagnostic and imaging studies in diagnosis of nerve compression syndromes

Specific competencies:

Upon completing the course students will:

- take accurate history of a patient with nerve compression syndromes
- perform a clinical examination in a patient with nerve compression syndromes
- perform and interpret provocation tests in a patient with nerve compression syndromes
- be able to determine which patients need to be referred for electrodiagnostic or imaging studies
- be able to interpret the results of electrodiagnostic or imaging studies
- be able to determine which patients can be managed non-operatively and which patients need to be referred for surgical treatment
- be able to explain to the patient the basics of the condition, treatment options and timing
- be able to assist in preparation of the patient for the operation and in the operative procedure.

II. COURSE STRUCTURE

Course hours:

Lectures: 6

Seminar: 6

Special clinical practicals: 13

Total hours: 25

Lectures: 6 Seminars: 6 Practical: 13

III. PLAN OF THE COURSE AND COURSE SCHEDULE

BLOCKS OF THE COURSE

Number of blocks: 1

Block number	Start	End
1.	22.1.2018	9.2.2018

BLOCKS OF THE COURSE

Number of blocks: 1

Block number	Start	End
1.	22.1.2018	9.2.2018

BLOCKS OF THE COURSE SCHEME

Block 1

Date	Time	Group	Course hours type	Theme	Teaching staff
Monday 22.1.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	L 1	Lectures	Anatomy of the upper extremity with regards to ulnar, median and radial nerve functions and compression neuropathies predilection sites	izv. prof. dr. sc. Vedran Katavić
	15:15-16:00; KBC, Kirurgija, Predavaonica	L 2	Lectures	Nerve compression syndromes of the median nerve	doc. dr. sc. Krešimir Bulić
Tuesday 23.1.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	L 3	Lectures	Nerve compression syndromes of ulnar and radial nerves	doc. dr. sc. Krešimir Bulić
	15:15-16:00; KBC, Kirurgija, Predavaonica	L 5	Lectures	Surgical treatment of nerve compression syndromes of the upper limb	doc. dr. sc. Krešimir Bulić
Wednesday 24.1.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	L 4	Lectures	Electrodiagnostic studies in the diagnosis of nerve compression syndromes of the upper limb	izv. prof. dr. sc. Ervina Bilić
	15:15-16:00; KBC, Kirurgija, Predavaonica	S 2	Seminar	Interpretation of electrodiagnostic studies in patients with nerve compression syndromes of the upper limb	izv. prof. dr. sc. Ervina Bilić
Thursday 25.1.2018.	14:30-15:15; KBC, Klinika za neurologiju, odjeli	P 9	Special clinical practicals	Nerve conduction studies	izv. prof. dr. sc. Ervina Bilić
	15:15-16:00; KBC, Klinika za neurologiju, odjeli	P 10	Special clinical practicals	Nerve conduction studies	izv. prof. dr. sc. Ervina Bilić
Friday 26.1.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	S 3	Seminar	The role of physical therapy in the treatment of nerve compression syndromes of the upper limb	doc. dr. sc. Porin Perić
	15:15-16:00; KBC, Klinika za reumatske bolesti i rehabilitaciju	P 13	Special clinical practicals	Physiotherapy in patients with nerve compression syndromes	doc. dr. sc. Porin Perić

Date	Time	Group	Course hours type	Theme	Teaching staff
Monday 29.1.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	S 5	Seminar	Carpal tunnel syndrome – problem based learning	doc. dr. sc. Krešimir Bulić
	15:15-16:00; KBC, Kirurgija, Predavaonica	S 6	Seminar	Carpal tunnel syndrome – problem based learning	doc. dr. sc. Krešimir Bulić
Tuesday 30.1.2018.	14:30-15:15; KBC, Kirurgija, Ambulanta - opća	P 1	Special clinical practicals	Pre and postoperative patient examination - Outpatient clinic Department of Surgery	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
	15:15-16:00; KBC, Kirurgija, Ambulanta - opća	P 2	Special clinical practicals	Pre and postoperative patient examination - Outpatient clinic Department of Surgery	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
Wednesday 31.1.2018.	14:30-15:15; Jednodnevna kirurgija	P 5	Special clinical practicals	Operating theater - carpal tunnel decompression	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
	15:15-16:00; Jednodnevna kirurgija	P 6	Special clinical practicals	Operating theater - carpal tunnel decompression	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
Thursday 1.2.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	L 6	Lectures	Nerve compression syndromes of the upper limb in association with systemic diseases	doc. dr. sc. Miroslav Mayer
	15:15-16:00; KBC, Kirurgija, Predavaonica	S 1	Seminar	Imaging studies in the diagnosis of nerve compression syndromes – when to use and what to expect?	doc. dr. sc. Miroslav Mayer
Friday 2.2.2018.	14:30-15:15; KBC, Interna klinika, Zavod za kliničku imunologiju i reumatologiju	P 11	Special clinical practicals	Ultrasonic diagnostics of nerve compression syndromes	doc. dr. sc. Miroslav Mayer
	15:15-16:00; KBC, Interna klinika, Zavod za kliničku imunologiju i reumatologiju	P 12	Special clinical practicals	Ultrasonic diagnostics of nerve compression syndromes	doc. dr. sc. Miroslav Mayer
Monday 5.2.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	S 4	Seminar	Non surgical treatment of nerve compression syndromes of the upper limb	doc. dr. sc. Krešimir Bulić
Tuesday 6.2.2018.	14:30-15:15; KBC, Kirurgija, Ambulanta - opća	P 3	Special clinical practicals	Pre and postoperative patient examination - Outpatient clinic Department of Surgery	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
	15:15-16:00; KBC, Kirurgija, Ambulanta - opća	P 4	Special clinical practicals	Pre and postoperative patient examination - Outpatient clinic Department of Surgery	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
Wednesday 7.2.2018.	14:30-15:15; Jednodnevna kirurgija	P 7	Special clinical practicals	Operating theater - carpal tunnel decompression	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
	15:15-16:00; Jednodnevna kirurgija	P 8	Special clinical practicals	Operating theater - carpal tunnel decompression	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.
Friday 9.2.2018.	14:30-15:15; KBC, Kirurgija, Predavaonica	SVI	Exam	Written examination	doc. dr. sc. Krešimir Bulić, Anto Dujmović, dr. med.

L1: Anatomy of the upper extremity with regards to ulnar, median and radial nerve functions and compression neuropathies predilection sites (VK)

A review of the upper extremity anatomy will be provided with an emphasis on the anatomy and function of the ulnar, median and radial nerves and anatomical predilection sites for compression neuropathies of ulnar, median and radial

nerves.

L2: Nerve compression syndromes of the median nerve (KB)

Three compression neuropathies of the median nerve will be presented, the pronator syndrome, the anterior interosseous syndrome and the carpal tunnel syndrome, with an emphasis on aetiology, clinical presentation and provocation signs.

L3: Nerve compression syndromes of ulnar and radial nerves (KB)

Two compression neuropathies of the ulnar nerve will be presented, the cubital tunnel syndrome and the ulnar tunnel syndrome, with an emphasis on aetiology, clinical presentation and provocation signs. Three compression neuropathies of the radial nerve will be presented, the posterior interosseous syndrome, the radial tunnel syndrome and the superficial radial nerve syndrome, with an emphasis on aetiology, clinical presentation and provocation signs.

L4: Electrodiagnostic studies in the diagnosis of nerve compression syndromes of the upper limb (EB)

Principles, indications and the role of electrodiagnostic studies, specifically electromyography and nerve conduction studies, will be presented with emphasis on reliability, drawbacks, the role in identifying compression site and in monitoring nerve recovery following surgical release.

L5: Surgical treatment of nerve compression syndromes of the upper limb (KB)

Principles and techniques of open carpal tunnel release, indications, contraindications, complications, short and long term results will be in depth provided. A brief outline of endoscopic carpal tunnel release and operative techniques for decompression of ulnar and radial nerve compression neuropathies will be provided.

L6: Nerve compression syndromes of the upper limb in association with systemic diseases (MM)

An overview of systemic diseases associated with nerve compression syndromes will be provided, indications for operative and non-operative treatment, the need for systemic therapy or the modification thereof and the treatment algorithm of these patients will be emphasized.

S1: Imaging studies in the diagnosis of nerve compression syndromes – when to use and what to expect? (MM)

The role of imaging studies, especially magnetic resonance imaging and ultrasound will be explained. The indications, reliability and availability of these tests in the diagnosis of various nerve compression syndromes will be explained.

S2: Interpretation of electrodiagnostic studies in patients with nerve compression syndromes of the upper limb (EB)

Interpretation of electromyography and nerve conduction studies with special attention to identification of compression sites will be presented. Students will have to prepare an interpretation of an electrodiagnostic study provided before.

S3: The role of physical therapy in the treatment of nerve compression syndromes of the upper limb (PP)

The role of physical therapy, as the principal treatment, or as an adjunct in operative treatment will be provided with an emphasis on various physical therapy

S4: Non surgical treatment of nerve compression syndromes of the upper limb (KB)

An approach to the treatment of patients with nerve compression syndromes of the upper limb that do not require surgical treatment will be provided. Principles of splinting and steroid injection therapy will be explained.

S5, S6: Carpal tunnel syndrome – problem based learning (KB)

A 3 step problem based learning case about a patient with carpal tunnel syndrome will be presented stressing the importance of individually tailored approach to diagnosis and treatment.

P1-P4: Outpatient clinic (KB, AD)

Students will attend an outpatient clinic session in the Department of Surgery outpatient department with patients suffering from nerve compression syndromes in various stages of their treatment. They will practice taking history, performing clinical examinations, performing provocation tests, applying steroid injections, performing dressing changes

and removing sutures..

P5-P8: Operating theatre (KB, AD)

Students will assist in operative decompressions of median nerve in patients with carpal tunnel syndrome in the day surgery department. Two students will be allowed to scrub in per patient. They will learn how to put on sterile surgical gloves, how to prepare the patient for the operation and apply tourniquet. They will be allowed to apply skin sutures under supervision and apply dressings after the operation. They will monitor the patient in the department until the release.

P9-P10: Nerve conduction studies (EB)

Students will attend electrodiagnostic studies at the Neurology department electrodiagnostic lab. They will be explained the details of the study and interpretation of the results.

P11-P12: Ultrasonic diagnostics of nerve compression syndromes (MM)

Students will attend ultrasound examinations of the carpal tunnel in patients with carpal tunnel syndrome at the Internal medicine department. They will be explained the details of the study and interpretation of the results.

P13: Physiotherapy in patients with nerve compression syndromes (PP)

Students will attend physical therapy sessions with patients with nerve compression syndromes undergoing pre or post operative physical therapy at the department of rheumatology

IV. EXAMINATIONS

Multiple choice questions examination

V./I. LIST OF LECTURERS AND TEACHING STAFF

1. doc. dr. sc. Krešimir Bulić
2. izv. prof. dr. sc. Ervina Bilić
3. izv. prof. dr. sc. Vedran Katavić
4. doc. dr. sc. Porin Perić
5. doc. dr. sc. Miroslav Mayer

V./II EXTERNAL ASSOCIATES:

1. Anto Dujmović, dr. med.

V./III UNTENURED LECTURERS:

VI. LITERATURE

Bradon J Wilhelmi, Ryan Naffziger, Michael Neumeister. Nerve Compression Syndromes of the Hand.
<http://emedicine.medscape.com/article/1285531-overview#a2>

Andrew Goldberg, Gerard Stansby (eds.) Surgical talk : revision in surgery . 2nd edition. London, Imperial College Press, 2005

Schwartz's Principles of Surgery. 10th edition. McGraw Hill, New York, 2015.

Yves Allieu, Susan E Mackinnon, "Nerve Compression Syndromes of the Upper Limb" CRC Press, 2008

Soo-Jung Choi, Jae Hong Ahn, Dae Shik Ryu, Chae Hoon Kang, Seung Mun Jung, Man Soo Park, Dong-Rock Shin.
Ultrasonography for nerve compression syndromes of the upper extremity. Ultrasonography 2015;34:275-291

Lecture hand-outs