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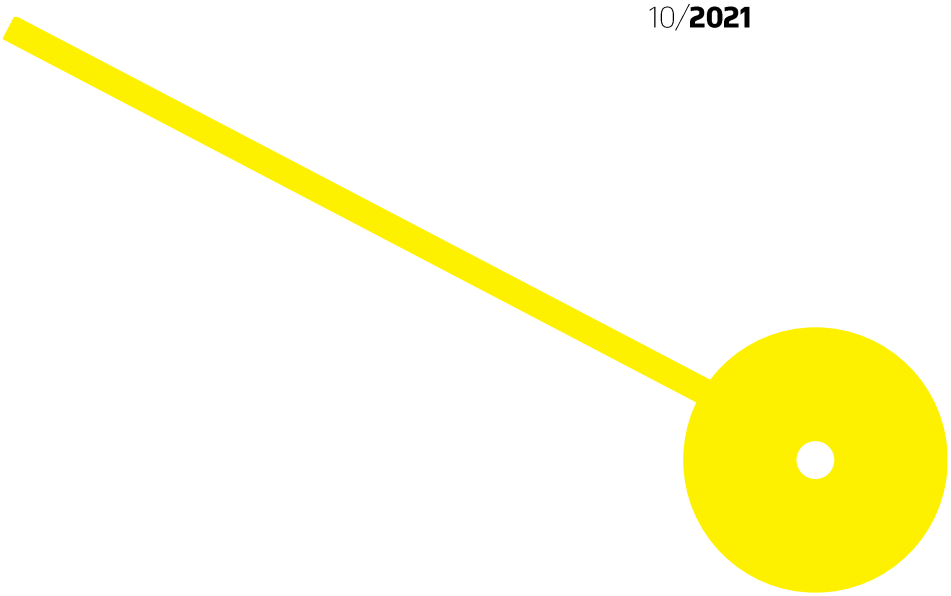
Outcomes and Management of Rectus Femoris tears in football players: a report of three cases

Armando Jorge Camacho da Costa

10/2021



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Outcomes and Management of rectus femoris tears in football players: a report of three cases

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Dissertação apresentada para cumprimento dos requisitos necessários à obtenção do grau de Mestre em **Fisioterapia** – Área de Especialização em **Desporto** pela Escola Superior de Saúde do Instituto Politécnico do Porto.

Resumo

Introdução: Roturas do quadricípite ocorrem com frequência em desportos como o futebol em que movimentos como correr e chutar o deixam vulnerável a uma potencial lesão.

Objetivo: Descrever as diferenças das medidas de avaliação e os resultados da reabilitação durante 4 meses e retorno à competição em jogadores de futebol após rotura do reto femoral em três atletas.

Métodos: Relato de 3 casos de roturas de reto femoral classificados através da *British Athletics Muscle Injury Classification*. Utilização de isocinético e dinamómetro para avaliação de força, Escala Visual Numérica para dor e GPS para avaliação da carga externa. O tratamento incluiu modalidades terapêuticas antiálgicas, treino de força e reabilitação de campo.

Resultados: os sujeitos foram capazes de voltar às atividades de equipa em 69, 29 e 26 dias respetivamente sem dor e com os valores de força iguais ou superiores aos de base.

Conclusão: Apesar dos 3 atletas terem uma lesão no mesmo músculo, as diferenças de localização e de estruturas envolvidas altera a duração de tratamento e retorno às atividades de equipa. A utilização desta classificação pode proporcionar aos fisioterapeutas uma visão mais concreta dos cuidados específicos a ter ao longo do processo de reabilitação e dos tempos esperados para o retorno à competição.

Palavras-chave: tratamento conservador; força; return to play; reabilitação; classificação de lesão.

Abstract

Introduction: Quadricep tears occur frequently in sports like football where there is running and kicking movements leading one to be vulnerable to injury.

Objective: To describe the differences in the assessment methods and the rehabilitation results throughout 4 months and the return to competition in 3 football players after rectus femoris injuries.

Methods: Report of 3 cases of rectus femoris tears classified using the British Athletics Muscle Injury Classification. Use of isokinetic and dynamometer for strength assessment, Visual Numerical Scale for pain and GPS for external load measurement. Treatment composed of antalgic methods, strength training and pitch rehabilitation.

Results: subjects were able to return to team activities in 69, 29 and 26 days respectively without pain and with equal or superiors strength values from the baseline.

Conclusion: Although all 3 players suffered an injury in the same muscle, the differences in location and specific structures alter the treatment duration and the return to team activities. The use of this scale may allow the physiotherapists a clearer vision on the specific required care throughout the rehabilitation process and the expected timelines to return to competition.

Keywords: conservative treatment; strength; return to play; rehabilitation; injury classification.

Índice

1. Introduction

The injury incidence varies on the competitive season, studies have shown that there is a higher rate of injury of the biceps femoris in the regular season (Ekstrand et al, 2011; Hawkins et al, 2001), whereas in the pre-season, the rectus femoris has a higher one. Ekstrand et al. mentions that quadriceps injuries stay constant throughout the season at a rate of 0.41 injuries per 1000h of exposure, which cause an absence of competition participation longer in comparison with Hamstrings and Pelvic injuries, also having a considerable re-injury rate (17%).

Quadriceps tears occur often in sports where there are consecutive sprints and a kicking motion, movements which are prevalent in a sport such as football (Brophy et al, 2010; Ekstrand et al, 2011; Orchard et al, 2000). Of the 4 muscles comprising the quadriceps, the rectus femoris is the one which has shown a higher incidence rate in comparison with the rest (Cross et al, 2004; Gyftopoulos et al, 2008; Orchard et al, 2000; Speer et al, 1993). Muscle tears usually happen during an eccentric contraction of said muscle (Garrett et al, 1990; Garrett et al, 1999; Glick et al, 1980; Kellis et al, 1995; Kujala et al, 1997; Stanton et al, 1989; Stauber et al, 1989; Zarins et al, 1983). Movements like sprinting and kicking require this type of contraction from the Rectus Femoris, this in conjunction with his bi-articular nature, leaves it vulnerable to a potential injury.

In acute Rectus Femoris injuries, the players usually feel a "tearing" sensation and stops play immediately. In sub-acute ones, the player mentions a gradual increase of pain during jogging and kicking. During the assessment, he can show pain during stretching, palpation of the local area and resisted knee extension. Usually, the injury location is more often in the Distal Myotendinous Junction (MTJ), near the knee joint (Chammout et al, 1986; Speer et al, 1993). Other injuries areas can be identified between the tendon and the muscle, or in the MTJ of the indirect head, mentioned by certain authors as the central part of the tendon (Bordalo-Rodriguez et al, 2005; Cross et al, 2004; Hasselman et al, 1995; Hughes et al, 1995 ; Ouellette et al, 2006; Wittstein et al, 2011). The last one is considered to be a more frequent in this type of injury in football.

In Australian Football reports, the central tendinous injury of the rectus femoris is associated with a longer recovery time (even more if it's proximal) and a longer absence in competitive activities in comparison with more distal injuries. The re-injury rate (17%), ossificans myositis, acute compartment syndrome and residual weakness are potential setbacks of this type of injury (Aronen et al, 2006; Burns et al, 2004; Ryan et al, 1991).

The treatment of muscle tears has not changed throughout the years and there is not a large scientific basis for most treatment protocols. Despite these factors, there are certain principles which provide a base for what is accepted as a method of treatment nowadays. When a muscle is acutely damaged due to a strain, contusion or laceration, there is bleeding and swelling in the affected muscle cells followed by an inflammatory reaction (Garrett et al, 1990). In the first phase, the emphasis is to reduce the symptoms and decrease the inflammatory components and interstitial fluid. The use of cryotherapy has shown effects regarding the management of pain due to the injury (Bleakey et al, 2004).

The acute treatment phase is followed by an active management from the moment that the injured leg is recovering appropriately. Usually, this phase starts around 3–5 days after the onset of the injury, depending on its severity. The main components of this phase are stretching, strengthening, increase of range of motion, maintenance of aerobic ability, proprioceptive exercises, and functional training. Stretching for instance must be done carefully and always until the point of discomfort and not pain. Despite its wide use in the sports field, there is still not much evidence regarding rehabilitation guidelines using the British Athletics Muscle Injury Classification (Pollock et al, 2014) as a basis of diagnosis and subsequent planning of the rehabilitation process, especially regarding the assessment criteria and excepted timelines in football. The goal of this study is a description of the rehabilitation process, assessment tools and team integration criteria in young football players that had a rectus femoris injury diagnosed using the British Athletics Muscle Injury Classification.

2. Methods

This article is a Retrospective Longitudinal Case Report Study, consisting in the description of the assessment, rehabilitation and return to play criteria on rectus femoris injuries in young football players. Between September 2020 and January 2021, 3 players from the U-19 team suffered an injury in the anterior facet of the thigh. After a clinical assessment by the physiotherapist and the team doctor using ecographic imagery, it was concluded that these 3 cases were all tears in the Rectus Femoris, with varying degrees and damaged structures of said muscle. The subjects ages were between 15 and 18 years of age. Subject A had the injury on his non-dominant leg while Subject B and C had on their dominant one.

All subjects were shown a Consent Form aligned with the *Helsinki Declaration* from the *World Medical Association* describing the purpose of this study, to assure that all information is classified and that they can drop out of the study at any time.

2.1. Assessment Methods

The assessment methods utilized in the treatment of the mentioned athletes were used to evaluate leg strength, sport specific loads and pain. In terms of leg strength it was used an Isokinetic for subject A due to a decision by the head physiotherapist, and a Manual Dinamometer from Neuroexcellence, for subjects B and C, for the sports specific loads a GPS tracker and for pain the Visual Numerical Scale (VNS) (Begum, MR 2019) GPS values measured the total distance, High Speed Running distance (HSR) which is speed above 5.5m/s and Sprint distance which is above 7m/s (Ravé et al, 2020).

The assessment method used with the manual dinamometer was placing the device at the distal third of the tibia at 0º of every hip movement. The subjects were lied down on the floor and asked to maintain their lower limb in complete extension (hip and knee at 0º), while pushing towards the device with as much power as possible. For the strength measurements all subjects performed the movement 3 times and the highest value was recorded. Limb dominance was considered the prefered leg in kicking motions (Dos'Santos et al, 2019; Maloney et al, 2018).

All strength and sports loads values were compared with the values previously mesured by the medical team during the pre-season as a criteria for rehabilitation goals.

2.2. Treatment Methods

Subjects underwent analgesic treatment for pain using modalities such as massage, cryotherapy, Transcutaneous Electrical Nerve Stimulation (TENS) and Tecar Therapy while these reported any pain.

In terms of strength training all subjects underwent an upper/lower program with 6 to 8 exercises, starting from compound and going to more isolated ones. The exercises were done for 3 sets of 8RM – 10RM, with a rest time between sets of 60 to 90 seconds (Suchomel et al, 2019), alternating between push and pull movements. On the upper body day, the performed sets of battle ropes to help maintain their cardiorespiratory capabilities.

Regarding the Return to Play section, which is composed of the specific movements and internal and external loads of the sport the player performs, it was started after there were no significant muscle imbalances and no pain in the affected area. Using the GPS data (Bourdon et al, 2017; McGuigan et al, 2017; Ravé et al, 2020) that the team gathered previously, the players were then exposed slowly to similar loads to simulate the load that they would experience on a match specially regarding the injury provoking movements as to make sure that the athlete can withstand said loads. This section of treatment was supervised by the team's physiotherapist.

At the onset of injury, all subjects began analgesic treatment until the moment they reported no pain symptoms alongside the strengthening program without the injured structures involved. These structures were included in the program the moment all assessment tests were negative. Return to Play section of treatment began the moment subjects reported a strength difference between lower limbs under 15% or reached the preseason values.

3. Results

Table 1 represents the demographic characteristics of the subjects that participated in this study.

Table 1: Subject's Demografic Data

Subject	Age	Position	Injury Classification	Dominant foot	Injury Mechanism	Injury Side
A	15	Defensive Midfielder	3C	Right	Passing	Left
B	17	Midfielder	2A	Right	Unspecific	Right
C	16	Wing	1C	Right	Stretching	Right

All subjects managed to return to team activities after the rehabilitation process with no issues and no immediate signs of re-injury. There were some differences in terms of how long they returned having Subject A taking 69 days post injury while Subject B and C took 29 and 26 days respectively. One of the reasons for this difference in timelines is due to the fact Subject A had a more severe injury with tendinous and miofascial damage while the others had only one type of struture damaged. The following sections demonstrate the specific values taken for each subject. GPS values are related to the distance percentage that the subjects were subjected weekly during the Return to Play portion of the treatment and the strength values are in kilograms as well the strengh percentages between limbs.

3.1. Subject A

During practice, while making a long pass, the athelete felt pain at the anterior region of the thigh on an intensity of 7/10 VNS. At the moment of the clinical examination, the player felt pain during the stretching, isometric and resisted contraction of the hip flexors and knee extensors (Table 2) and while walking. However, he did not show any symptoms in any other movement of the hip and knee joints. Through an ecographic examination, it was shown that the athlete had a 3c tear on the direct tendon of the left Rectus femoris. There were no records of the strenght levels during the pre-season for this particular player has he had been proted from a younger team in the club recently.

Table 2. Muscle Injury Assessment Subject A.

	Days post injury	+1			+7			+15		
	Tests	Pain			Pain			Pain		
		Y	N	VNS	Y	N	VNS	Y	N	VNS
Medium Arc	Stretching	x		5		x			x	
	Isometric Contraction	x		4		x			x	
	Resisted Contraction	x				x			x	
External Arc	Stretching	x		2	x		2		x	
	Isometric Contraction	x		2		x			x	
	Resisted Contraction	x				x			x	
	Palpation/Touch	x		4	x		2		x	

This is an assessment table that records the moment and intensity of the pain symptoms reported in each of the examination timelines. As the table shows, the subject no longer reported any pain 15 days after the onset of injury. Meaning in terms of rehabilitation process, he could start to load the injured structures.

3.2. Subject B

The athlete felt a pain after a match at the anterior region of the thigh, not remembering a specific moment that could have provoked said symptom. During the clinical examination, he felt pain while stretching, contracting isometrically and resisted the hip flexors and knee extensors. He did not show any other pain regarding other movements of the hip and knee joint. He undertook an ecographic exam and was diagnosed with a 2a tear on his right Rectus femoris. During the preseason tests, the player had only shown a difference of 23% strength in the adductors, having every other muscle group in the recommended values. He recorded a 14% difference in strength at the hip flexors, his right leg being stronger than his left, although inside the recommended values, it is very close to the threshold.

Table 3. Muscle Injury Assessment Subject B.

	Days post injury	+0			+5			+6			+12		
	Tests	Pain			Pain			Pain			Pain		
		Y	N	VNS	Y	N	VNS	Y	N	VNS	Y	N	VNS
Medium Arc	Stretching	x		7		x			x		–	x	–
	Isometric Contraction	x		5		x			x		–	x	–
	Resisted Contraction	x		5		x			x		–	x	–
External Arc	Stretching	x		9	x		8	x	-	4	–	x	–
	Isometric Contraction	x		5		x			x		–	x	–
	Resisted Contraction	x		5		x			x		–	x	–
	Palpation/Touch	x		5	-	x	~-		x		–	x	–

This is an assessment table that records the moment and intensity of the pain symptoms reported in each of the examination timelines. As the table shows, the subject no longer reported any pain 12 days after the onset of injury. Meaning in terms of rehabilitation process, he could start to load the injured structures.

3.3. Subject C

During a practice session the player felt a pain at the anterior region of the thigh while performing a change of directions which lead him to not being able to continue. During examination he only felt pain at the end range of motion of stretching and also while contracting at the same range of the hip flexors. He had shown no pain in any other movement of the hip joint. After an ecographic exam, he was diagnosed with a 1c tear of the indirect tendon of his left rectus femoris. During the preseason tests, the player did not show any significant differences in strenght, having all values in the recommended values.

Table 3. Muscle Injury Assessment Subject C.

	Days post injury	+1			+13		
	Tests	Pain			Pain		
		Y	N	VNS	Y	N	VNS
Medium Arc	Stretching	-	X	-		x	
	Isometric Contraction	-	X	-		x	
	Resisted Contraction	-	X			x	
External Arc	Stretching	x		4	-	X	-
	Isometric Contraction	x		4		X	
	Resisted Contraction	x		4		X	
	Palpation/Touch	x		3	-	X	-

This is an assessment table that records the moment and intensity of the pain symptoms reported in each of the examination timelines. As the table shows, the subject no longer reported any pain 13 days after the onset of injury. Meaning in terms of rehabilitation process, he could start to load the injured structures.

3.4. Subject A specific results

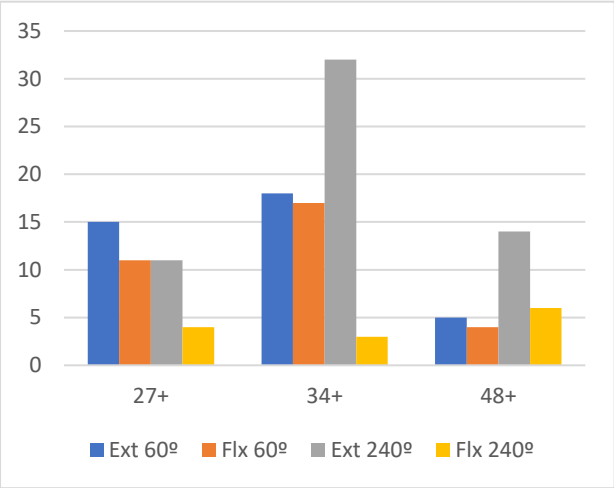
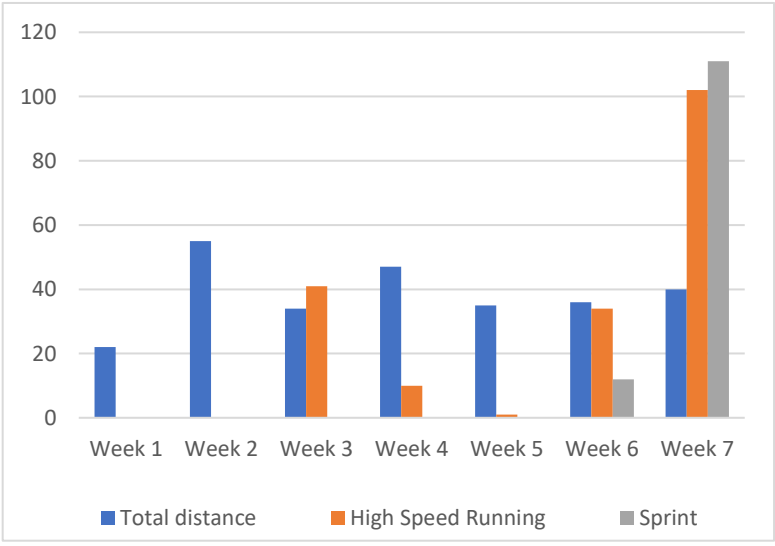


Fig 1. Knee strength Ratio in Percentage – Isokinetic
X-axis: Days after injury
Y-axis; Strength difference in percentage (%)

Subject A began the RTP part of the treatment on the 20+ day of the onset of injury (Fig 1). At this time, he reported no pain in any of the movements he previously mentioned, and he already had done strength work to prepare the muscles for this type of stimuli.

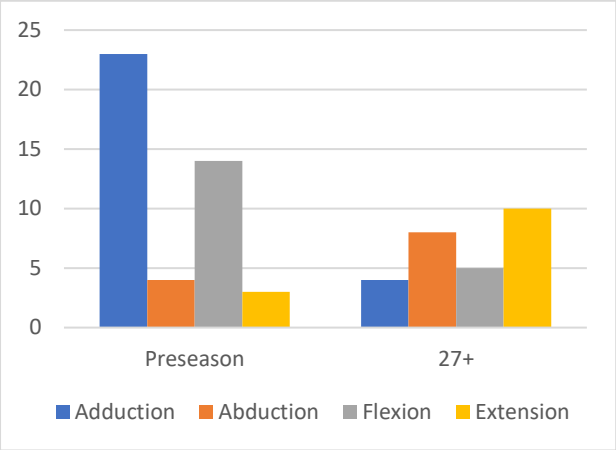
Between day 27+ and 34+, the subject increased the difference in strength performing and Extension movement at 240º/s. At that moment, the strength training had to undergo a change by increasing the volume by another set to the weaker limb and decreasing the stronger one by one set. At day 48+ all values were below 15% difference between limbs.

Since Subject A had a longer period of rehabilitation, it was important to make sure that he could withstand the specific sports loads and have a more thorough approach to his recovery. Although his position did not require him to perform large distances at high speeds, it was one of the goals to make sure he could perform said loads without any repercussions (Graph 2). All specific strength values are in Appendix 1.



Graph 2: Return to Play A X-axis: Time in Weeks Y-axis: GPS values in percentage (%)

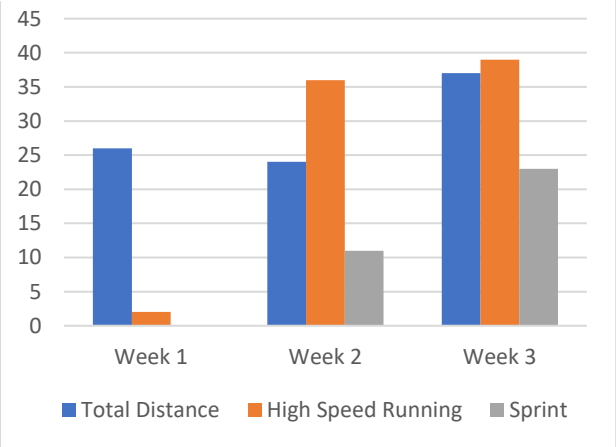
3.5. Subject B specific results



Graph 3: Hip Strength ratio in percentage

X-axis: Days after injury

Y axis: Strength difference in percentage (%)



Graph 4: Return to Play B X-axis: Time in Weeks Y-axis: GPS values in percentage (%)

On the day +27 of the onset of injury, the subject underwent a new assessment in which all strength values were under the 15% recommend mark (Graph 3). Subject B did not undergo the full weekly load (Graph 4) he reported with the team since both his position and the type of injury he suffered did not require this level of concern. Since his rehabilitation period was relatively shorter, he did not decondition enough to exist the need to achieve the values he had set previously. Therefore, it was not set as an objective for the player to be clear to return to the team activities.

All specific strength values are in Appendix 2.

3.6. Subject C specific results

Table4: Hip Strength (Kg) and Ratio (%).

	Preseason			+13		
Aduction	24.7	22	11%	26.3	25.3	4%
Abduction	19.8	16.9	15%	22.6	20.2	11%
Flexion	16.2	14.3	12%	30	23.4	22%
Extension	23.3	22.4	4%	26	27.6	6%

Over the course of the rehabilitation process, subject C managed to achieve the values recorded during the preseason and surpass them. One movement in particular, (Hip Flexion) increased considerably in strength. Despite the difference between limbs being above 15%, the fact that the rehab period was relatively short and the increase in strength in comparison with the baseline values, this value was not given too much emphasis in order for the subject to return to the team activities (Table. 4). All specific strength values are in Appendix 3.

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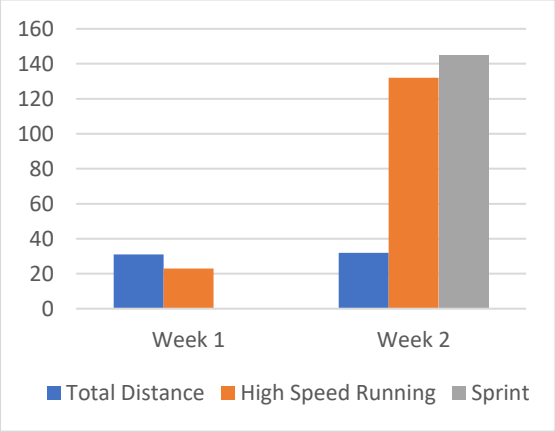

Graph 5: Return to Play C X-axis: Time in Weeks Y-axis: GPS values in percentage (%)

Subject C's position requires him to perform larger distances, therefore it was necessary to provide that type of stimuli to ensure that the player could return to the team activities and not have any pain symptoms or a great risk of reinjury. Over the course of just 2 weeks the subject was able to withstand over 100% of the HSR and Sprint distances with no setbacks (Graph 5).

4. Discussion

The British Athletics Muscle Injury Classification is still not widely used in scientific literature and is still not mentioned in rehabilitation guidelines despite it's use in the field. This Case Report Study can contribute in giving light to how different injury grades can manifest during the rehabilitation process.

As this study was done retrospectively, the assessment methods utilised were not the same for all subjects, and comparision between them can't be realized. Analysis of this study should take this into account, and potential future studies would be advised to limit this methodological bias.

The difference of criteria for team integration between the subjecs had different factors between them, such as duration of activity cessation, the injured structured involved, their severity and the player's position and main movements in their specific playstyle. For instance Subject C played a position in which High Speed Running and Sprint are the backbone of his role, this and taking into account the fact that the injury was in the rectus femoris tendon, it was paramount for the sport specific loads to represent what was expected from the player's performance. Comparing with Subject B which role didn't need such attention to said loads and the rehab focus was on strength symetry and ratios. Regarding Subject A, his rehabilitation process was longer not only due to the severity of the injury and it's location but also due to the lack of previous information regarding pre-season values and also the difference of leg strength that he reported having the need to adjust the stimuli given to him in order to balance out the differences.

There is already quite some evidence regarding the treatment protocols for muscle and tendinous tears, however, not all injuries are the same. As this study shows, although all athletes had an injury in the same structure, the exact location and the severity of said injury varied and therefore the criteria for them to return to team activities differed. Injuries that involved tendinous structures required a longer rehabilitation period even when compared to a more severe injury that only involved myofibrillar tears (Mendiguchia et al, 2013) which was consisted to what was observed in this study. The player role in the specific sport also had an influence on the emphasis of rehabilitation, such as wing players in football, expected to have longer average sprint distances which led for a RTP more focused on the High Speed Running and Sprint distances (Ravé et al, 2020).

This study also demonstrated that is possible to use different methods of assessment regarding strength values for the same purpose, as long as the assessment method is maintained

throughout the rehabilitation and assessment process from the onset of injury until the athletes return to the team.

The use of the British Athletics Muscle Injury Classification (Pollock et al, 2014) allows the medical team to have a more exact view on the specifics required for each player and how the treatment will proceed taking into account the needs and goals of the patients.

More research is required using this classification at different age groups and competition level in order to create guidelines to better guide physiotherapists when tackling these types of injuries in their field while also having a better understanding of the timelines expected for the athletes to start strength training and Return To Play.

5. Conclusion

The purpose of this study was to describe the rehabilitation process of a rectus femoris injury in young football players and the differences that could occur between subjects in terms of assessment and treatment. Strength symmetry and recovery to pre-injury values were very important goals for the player to be ready to return to the field and to decrease the risk of reinjury. Different GPS values were set in the Return To Play section of treatment to be more aligned with the stimuli that each player usually faces during a match having a larger focus on the Sprint and High Running Distance for subject C as he was a wing player.

Subjects A, B and C took 69, 29 and 26 days to be cleared to return to team activities respectively showing the possible disparity in timelines between different degrees and involved structures. At the moment of medical clearance, subjects reported no pain symptoms, restored all strength values and symmetries for the exception of Subject C whose values increased in comparison with the pre-injury values.

Taking into account the position and play-style of the athletes is paramount to set the rehabilitation goals, specially in the Return To Play aspect of treatment. By taking these in consideration, the physiotherapist is able to plan the stimuli required for the athlete to be prepared for what is required of him in terms of performance.

Setting these goals also have the purpose of diminishing the probability of reinjury and therefore lessening the number of days that the athlete cannot perform and contribute in a team setting.

Despite the three athletes suffering an injury in the same muscle, the differences in location and involved structures changes to rehabilitation timelines and their return to the team activities. The use of this Classification can provide physiotherapists a more concrete vision of the specific care and process throughout the rehabilitation and the expected timelines to return to competition.

6. Acknowledgements

I would like to thank therapist Ruben Ferreira for the opportunity to do the internship at the football club, therapist Gonçalo Arneiro for his guidance throughout the whole time I spent there, to all the players that were willing to be part of this study and consented the sharing of information and a thank you to all the medical and coaching staff at Sporting Clube de Portugal.

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8. Appendixes

Appendix 1: Isokinetic values Subject A

			+27	+34	+48
Con/Con – 60º/s	Peak Torque Extensors	Left	258	277	268
		Righ	305	339	283
		Ratio	15%	18%	5%
	Peak Torque Flexors	Left	145	175	199
		Right	163	212	191
		Ratio	11%	17%	4%
ECC – 30º/s	Peak Torque Flexors	Left	174	237	254
		Right	187	267	252
		Ratio	7%	11%	1%
Con/Con – 240º/s	Peak Torque Extensors	Left	132	129	144
		Right	148	190	168
		Ratio	11%	32%	14%
	Peak Torque Flexors	Left	106	121	119
		Right	110	125	127
		Ratio	4%	3%	6%

Appendix 2: Dynamometer values Subject B

Dynamometer (CVM)

	Bodyweight	Preseason			+27		
	76	**Right**	**Left**		**Right**	**Left**	
	Squeeze SHORT Lever		**42**			**51.8**	
	Squeeze LONG Lever		**-**			**-**	
	Squeeze SHORT / PC		55.3%			68.2%	
	Squeeze LONG / PC		0.0%			0.0%	
Groin - Anca	**Adução**	**26.4**	**20.4**	23%	**30.9**	**27.7**	10%
	Abdução	**24.3**	**25.3**	4%	**29.2**	**26.9**	8%
	Flexão	**26.7**	**22.9**	14%	**29.5**	**28.1**	5%
	Extensão	**24.7**	**23.9**	3%	**27.5**	**30.6**	10%
	Rácio ADD/ABD	1.09	0.81	26%	1.06	1.03	3%
	Rácio ADD/FLEX	0.99	0.89	10%	1.05	0.99	6%
	Rácio FLEX/EXT	1.08	0.96	11%	1.07	0.92	14%
	Flexão Joelho 90º	**-**	**-**	0%	**33.4**	**32.3**	3%
	Extensão Joelho 90º	**-**	**-**	0%	**42.7**	**42.3**	1%
	Ratio H:Q ISO 90º	0%	0%	-	78%	76%	-

Appendix 3: Dynamometer Values Subject 3

	Bodyweight	Preseason			+13		
	65	**Right**	**Left**	**Diff**	**Right**	**Left**	**Diff**
	Squeeze SHORT Lever		**40.2**			**49.7**	
	Squeeze LONG Lever		**-**			**-**	
	Squeeze SHORT / PC		61.8%			76.5%	
	Squeeze LONG / PC		0.0%			0.0%	
Groin - Anca	**Adução**	**24.7**	**22**	11%	**26.3**	**25.3**	4%
	Abdução	**19.8**	**16.9**	15%	**22.6**	**20.2**	11%
	Flexão	**16.2**	**14.3**	12%	**30**	**23.4**	22%
	Extensão	**23.3**	**22.4**	4%	**26**	**27.6**	6%
	Rácio ADD/ABD	1.25	1.30	4%	1.16	1.25	7%
	Rácio ADD/FLEX	1.52	1.54	1%	0.88	1.08	19%
	Rácio FLEX/EXT	0.70	0.64	8%	1.15	0.85	27%

Anexos – Consentimentos Informados

P.PORTO

ESCOLA
SUPERIOR
DE SAÚDE
POLITÉCNICO
DO PORTO

TERMO DE CONSENTIMENTO INFORMADO

DESIGNAÇÃO DO ESTUDO: Outcome and Management of neck and low back pain in football players: reports of three cases

Declaração de Consentimento Informado

Conforme o RGPD, a Lei n.º 67/98 de 26 de Outubro e a "Declaração de Helsínquia" da Associação Médica Mundial (Helsínquia 1964, Tóquio 1975; Veneza 1983; Hong Kong 1989; Somerset West 1996, Edimburgo 2000; Washington 2002, Tóquio 2004, Seul 2008, Fortaleza 2013) – quando se aplica

Eu, Dário Cassia Luis Fessujo abaixo-assinado (NOME COMPLETO):

Fui informado de que o Estudo de investigação acima mencionado se destina a descrever o processo de reabilitação de uma rotura de reto femoral desde o momento de lesão até ao retorno às atividades de equipa.

Sei que neste estudo está prevista a realização de avaliação da capacidade física (avaliação da condição, força e *Return to Play*), entrevista e tratamento com recurso a meios eletrofísicos (Tecar, crioterapia, TENS) e exercício físico terapêutico, tendo-me sido explicado em que consistem e quais os seus possíveis efeitos.

Foi-me garantido que todos os dados relativos à identificação dos Participantes neste estudo são confidenciais e que será mantido o anonimato.

Sei que posso recusar-me a participar ou interromper a qualquer momento a participação no estudo, sem nenhum tipo de penalização por este facto.

Compreendi a informação que me foi dada, tive oportunidade de fazer perguntas e as minhas dúvidas foram esclarecidas.

Aceito participar de livre vontade no estudo acima mencionado

Concordo que sejam efetuados os exames e tratamentos que fazem parte deste estudo.

Também autorizo a divulgação dos resultados obtidos no meio científico, garantindo o anonimato.

Armando Jorge Carnecho da Costa, ajorgecosta@gmail.com 914402051

03/09/2021 Dário Fessujo

P.PORTO

ESCOLA
SUPERIOR
DE SAÚDE
POLITÉCNICO
DO PORTO

TERMO DE CONSENTIMENTO INFORMADO

DESIGNAÇÃO DO ESTUDO: Outcomes and Management of rectus femoris tears in football players, respects of three years

Declaração de Consentimento Informado

Conforme o RGPD, a Lei nº 67/98 de 26 de Outubro e a "Declaração de Helsínquia" da Associação Médica Mundial (Helsínquia 1964, Tóquio 1975, Veneza 1983, Hong Kong 1989, Somerset West 1996, Edimburgo 2000, Washington 2002, Tóquio 2004, Seul 2008, Fortaleza 2013) – quando se aplica

Eu, Ivan Rodrigues Carvalho dos Anjos (NOME COMPLETO), abaixo-assinado

Fui informado de que o Estudo de Investigação acima mencionado se destina a descrever o processo de reabilitação de uma rotura de reto femoral desde o momento de lesão até ao retorno às atividades de equipa.

Sei que neste estudo está prevista a realização de avaliação da capacidade física (avaliação da condição, força e *Return to Play*), entrevista e tratamento com recurso a meios eletrofísicos (Tecar, crioterapia, TENS) e exercício físico terapêutico, tendo-me sido explicado em que consistem e quais os seus possíveis efeitos.

Foi-me garantido que todos os dados relativos à identificação dos Participantes neste estudo são confidenciais e que será mantido o anonimato.

Sei que posso recusar-me a participar ou interromper a qualquer momento a participação no estudo, sem nenhum tipo de penalização por este facto.

Compreendi a informação que me foi dada, tive oportunidade de fazer perguntas e as minhas dúvidas foram esclarecidas.

Aceito participar de livre vontade no estudo acima mencionado.

Concordo que sejam efetuados os exames e tratamentos que fazem parte deste estudo.

Também autorizo a divulgação dos resultados obtidos no meio científico, garantindo o anonimato.

Armando Jorge Camacho da Costa, ajorgecosta@gmail.com 914402051

8.9.2021 Ivan Anjos

DESIGNAÇÃO DO ESTUDO: Outcomes and Management of rectus femoris tears in football players: resports of three cases

Declaração de Consentimento Informado

Conforme o RGPD, a Lei n.º 67/98 de 26 de Outubro e a "Declaração de Helsínquia" da Associação Médica Mundial (Helsínquia 1964; Tóquio 1975; Veneza 1983; Hong Kong 1989; Somerset West 1996, Edimburgo 2000; Washington 2002, Tóquio 2004, Seul 2008, Fortaleza 2013) – quando se aplicar

Eu, Tristan shane hammond abaixo-assinado

_____(NOME COMPLETO):

Fui informado de que o Estudo de Investigação acima mencionado se destina a descrever o processo de reabilitação de uma rotura de reto femoral desde o momento de lesão até ao retorno às atividades de equipa.

Sei que neste estudo está prevista a realização de avaliação da capacidade física (avaliação da condição, força e *Return to Play*), entrevista e tratamento com recurso a meios eletrofísicos (Tecar, crioterapia, TENS) e exercício físico terapêutico, tendo-me sido explicado em que consistem e quais os seus possíveis efeitos.

Foi-me garantido que todos os dados relativos à identificação dos Participantes neste estudo são confidenciais e que será mantido o anonimato.

Sei que posso recusar-me a participar ou interromper a qualquer momento a participação no estudo, sem nenhum tipo de penalização por este facto.

Compreendi a informação que me foi dada, tive oportunidade de fazer perguntas e as minhas dúvidas foram esclarecidas.

Aceito participar de livre vontade no estudo acima mencionado

Concordo que sejam efetuados os exames e tratamentos que fazem parte deste estudo.

Também autorizo a divulgação dos resultados obtidos no meio científico, garantindo o anonimato.

Armando Jorge Camacho da Costa, ajorgeccosta@gmail.com
914402051

11 / 10 / 2021 _____